

RoHS Compliance (Pb-Free) For Ecliptek Crystals and Oscillators Frequently Asked Questions

Rev C

1. Why has Ecliptek transitioned to RoHS (Pb-free) components and assemblies?

Ecliptek has implemented a RoHS compliance, lead-free (Pb-free) program in response to concerns about the environmental impact of Lead (Pb) and other hazardous substances used in the manufacturing of electronic components and assemblies. Regulatory groups around the world have initiated legislation calling for companies to utilize RoHS (Pb-free) manufacturing processes and components. Because of this legislation, many of our customers are requesting products that utilize Pb-free manufacturing processes and components which are compliant to the RoHS directive.

2. What directives have been established by the various regulatory groups?

The European Union Parliament approved the content of two directives to better control the management of waste electronic equipment. The two directives are the Waste from Electrical and Electronic Equipment (WEEE) and the Restriction of Hazardous Substances (RoHS). WEEE Directive 2012/19/EU addresses the collection, recycling and recovery requirements of waste electronic equipment for the member countries. Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) restricts the use of specific materials above certain limits unless there is an exemption provided in the rule.

3. Is RoHS compliance mandatory throughout the world?

RoHS compliance is only mandatory on products shipped into the European Union (EU) or member countries. However, since many other jurisdictions have similar or pending legislation and since many manufacturers products may eventually find their way into the EU, RoHS compliance is having a global effect.

4. What is EU RoHS Directive 2011/65/EU?

This directive is the recast of EU RoHS Directive 2002/95/EC. It is officially known as Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. This directive was published in the Official Journal of the European Union on July 1, 2011 and entered into force on July 21, 2011.

5. What are the substances banned by the RoHS recast directive and their maximum concentration values (MCV)?

The restricted substances referred to in Article 4(1) of EU RoHS Directive 2002/95/EC and published in Annex II of this RoHS directive are shown in Table 1. The table includes the maximum concentration value (MCV), or threshold limit, at which a restricted substance can be present or above which a declarable substance needs to be reported. The substance shall not be intentionally introduced and shall be a homogeneous material that cannot be mechanically disjoined into different materials.

Table 1: Restricted RoHS Substances

Substance	MCV
Lead	0.1%
Mercury	0.1%
Cadmium	0.01%
Hexavalent chromium	0.1%
Polybrominated biphenyls (PBB)	0.1%
Polybrominated diphenyl ethers (DBDE)	0.1%

6. What is European Commission Delegated Directive (EU) 2015/863?

The European Commission has adopted a ban on the use of certain substances in electrical and electronic equipment (EEE). On June 4, 2015, European Commission Delegated Directive (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances was published. As stated in Article 1 of this directive, Annex II to Directive 2011/65/EU is replaced by the text in the Annex of this directive. The amendment adds four phthalates to the list of restricted substances.

7. What are the substances banned by RoHS Commission Delegated Directive (EU) 2015/863 and their maximum concentration values (MCV)?

The restricted substances referred to in Article 4(1) of EU RoHS Directive 2011/65/EU and published in the Annex of Commission Delegated Directive (EU) 2015/863 are shown in Table 2. The table includes the maximum concentration value (MCV), or threshold limit, at which a restricted substance can be present or above which a declarable substance needs to be reported. The substance shall not be intentionally introduced and shall be a homogeneous material that cannot be mechanically disjoined into different materials.

Table 2: Restricted RoHS Substances

Substance	MCV
Lead	0.1%
Mercury	0.1%
Cadmium	0.01%
Hexavalent Chromium	0.1%
Polybrominated biphenyls (PBB)	0.1%
Polybrominated diphenyl ethers (DBDE)	0.1%
Dibutyl phthalate (DBP)	0.1%
Butyl benzyl phthalate (BBP)	0.1%
Bis (2-ethylhexyl) phthalate (DEHP)	0.1%
Diisobutyl phthalate (DIBP)	0.1%

8. What is Ecliptek's definition of Pb-free content?

An Ecliptek component or assembly shall be defined as Lead-free (or Pb-free) when the Lead (Pb) content of the device is less than 0.1% by weight, is not intentionally introduced, and shall be homogeneous material that can not be mechanically disjoined into different materials.

9. What is Ecliptek's definition of a component?

Ecliptek's definition of a component applies to quartz crystal devices.

10. What is Ecliptek's definition of an assembly?

Ecliptek's definition of an assembly applies to oscillator devices (MEMS Oscillator, XO, VCXO, TCXO, or TCVCXO).

11. How can I obtain a RoHS certification letter from Ecliptek?

A RoHS certification letter can be obtained via the Ecliptek [Self-Service Documentation Access](#) page or under the 'Documentation' column of a Part Number Details page on our website.

12. What is the purpose of the IPC 1752 standard?

The IPC-1752 standard is a materials declaration management standard. The purpose of the IPC-1752 standard is to document and promote a uniform data format for exchanging materials composition data. The IPC standard establishes classes for the declaration of materials, manufacturing process information, and product substances.

13. Does Ecliptek offer material declarations for its components and assemblies?

Material declarations, in compliance with IPC-1752, are available for all Ecliptek products. Component and assembly information can be obtained via the Ecliptek [Self-Service Documentation Access](#) page or under the 'Documentation' column of a Part Number Details page on our website.

14. What are the recommended solder reflow profiles provided by Ecliptek?

The recommended solder reflow profile for all Ecliptek components or assemblies can be found on the applicable part number data sheet.

15. What is the terminal plating material and terminal plating thickness used on Ecliptek components and assemblies?

The terminal plating (finish) material and terminal plating thickness for Ecliptek components and assemblies can be found in the applicable Ecliptek IPC-1752 material declaration.

16. What is the Pb-free solder composition qualified by Ecliptek?

Ecliptek has qualified the following Pb-free solder compositions: Sn95.5Ag3.9Cu0.6 and Sn96.5Ag3.0Cu0.5.

17. What is the solder composition recommended by Ecliptek?

Ecliptek does not make solder composition recommendations. It is the customer's responsibility to qualify a solder to be used in their application.

18. What qualification and reliability testing has been completed to evaluate and qualify Ecliptek components and assemblies?

Qualification and reliability reports for all Ecliptek components or assemblies can be obtained via the [Ecliptek Self-Service Documentation Access](#) page or under the 'Documentation' column of a Part Number Details page on our website.

19. What packaging standards exist for product packages?

There are two jointly developed standards that address device moisture sensitivity and packaging:

- IPC/JEDEC J-STD-020 - Moisture/Reflow Sensitivity Classification for Non-Hermetic Solid State Surface Mount Devices
- IPC/JEDEC J-STD-033 - Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices, provides SMD manufacturers

20. What is the purpose of the IPC/JEDEC J-STD-020 standard?

The purpose of the IPC/JEDEC J-STD-020 standard is to identify the moisture/reflow sensitivity classification level of non-hermetic solid state surface mount devices.

21. What is the purpose of the IPC/JEDEC J-STD-033 standard?

The purpose of the IPC/JEDEC J-STD-033 standard is to document the handling, packing, shipping, and use of products which have been classified to the levels defined in IPC/JEDEC J-STD-020.

22. What is the purpose of the JEP-113 standard?

The purpose of the JEP-113 standard is to document the labeling and associated symbols for moisture sensitive devices as classified to the levels defined in IPC/JEDEC J-STD-020.

23. What is the moisture sensitivity level (MSL) for Ecliptek products?

The moisture sensitivity level for all components or assemblies is shown in the Environmental and Mechanical Specifications section on the applicable part number data sheet.

24. Does Ecliptek have a special component or assembly marking scheme for RoHS Compliant and RoHS Compliant (Pb-free) products?

There are no legislated RoHS requirements for individual component or assembly marking. The marking content for all Ecliptek components or assemblies is shown on the applicable part number data sheet.

25. Does Ecliptek have a labeling method for shipment packaging of RoHS Compliant products?

Ecliptek has a labeling method for the unit packaging of all RoHS Compliant products. The lowest level shipping container shall have a label that includes the following content: Moisture sensitivity level, RoHS compliance status, and Pb-free status.

26. Are there any changes required in component or assembly storage conditions of RoHS Compliant or RoHS Compliant (Pb-free) products?

There are no changes in the storage condition specifications. Upon receipt of Ecliptek products, it is always good manufacturing practice to store components and assemblies in their original unit packaging and in a controlled environment so as not to expose them to extremes of humidity and temperature for extended periods of time and to protect them from damage.

27. Do I need to make any process or material changes to my PCB assembly process to use Ecliptek RoHS Compliant or RoHS Compliant (Pb-free) products?

Pb-free components and assemblies manufactured by Ecliptek are qualified for use in PCB assembly processes using either Tin-Lead (SnPb) or Tin-Silver-Copper (SnAgCu) solders for component attachment. Ecliptek qualification testing indicates that Ecliptek RoHS Compliant and RoHS Compliant (Pb-free) components and assemblies can be used interchangeably in either PCB assembly process.

28. Are products classified as RoHS Compliant or RoHS Compliant (Pb-free) forward and backwards compatible to Lead (Pb) and Pb-free PCB reflow processes?

Solderability testing has been performed by Ecliptek to ensure both forward and backward process compatibility of RoHS Compliant and RoHS Compliant (Pb-free) products with various PCB assembly environments. To certify forward compatibility, solderability testing was performed using SnAgCu solder at higher temperatures (as high as 260C). In order to certify backwards compatibility, standard Tin-Lead (SnPb) solder was used at lower temperatures (as low as 215C).

Ecliptek qualification test results demonstrate that products classified as RoHS Compliant or RoHS Compliant (Pb-free) can be successfully integrated into either Pb-free or traditional Tin-Lead (SnPb) PCB assembly processes.

29. Who at Ecliptek is coordinating the company's RoHS compliance effort?

An Ecliptek RoHS compliance team has been established and meets regularly to coordinate RoHS company policy. This team coordinates all RoHS tasks with respect to our manufacturing locations, qualified subcontractors, and customers. All customers can obtain the status of the team's on-going efforts by reviewing these FAQ's and associated RoHS links.

30. Who can Ecliptek customers contact for addition information about their RoHS questions?

Please contact the [Ecliptek Global Customer Support](#) team for additional information.

31. Can Ecliptek provide documentation to support the new RoHS recast declaration of conformity requirements?

The recast of the EU RoHS Directive (2011/65/EU) has introduced new obligations for conformity assessment and declaration of electrical and electronic products. Before placing an end item EEE product on the market, a manufacturer, importer, or distributor must ensure that the appropriate conformity assessment procedure in line with Module A of Annex II (Decision No 768/2008/EC) has been conducted. To assist customers with this requirement, material declarations, in compliance with IPC-1752, as well as RoHS certifications are available for all Ecliptek components or assemblies.

32. What are RoHS exemptions?

Annex III of Directive RoHS 2011/65/EU references applications exempted from the restriction in Article 4(1) of the directive. This annex includes the exemption number, description, scope, and dates of applicability. Exemptions are given for defined applications for which the elimination of the prohibited substance is technically or scientifically impracticable or when the available substitution produces negative benefits to the environment, health, or consumer safety.

33. Where are RoHS exemptions applicable to Ecliptek products located?

Exemptions to the RoHS directive, if any, can found on the applicable Ecliptek part number RoHS certification letter.

34. Why are some customers interested in concentration levels not listed in the RoHS directives?

Some customers may have their own internal substance control requirements that exceed the RoHS directive. If a customer has additional substance requirements beyond the current RoHS substances, please contact the [Ecliptek Global Customer Support](#) team.

35. Do Ecliptek components and assemblies contain REACH substances of very high concern (SVHC)?

Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 is commonly referred to as REACH. REACH stands for the Regulation for Registration, Evaluation, Authorization, and Restriction of Chemicals. The REACH Regulation entered into force on 1st June 2007 to streamline and improve the former legislative framework for chemicals of the European Union (EU) and European Economic Area (EEA) countries. Information about REACH SVHC can be found on the Ecliptek [REACH Compliant Roadmap](#) page of our website.

36. Does Ecliptek provide self-service documentation access online?

Ecliptek has developed many innovative tools to rapidly and efficiently provide engineering and purchasing professionals the accurate, comprehensive information they need to find the right frequency control solution, every time. Ecliptek offers [Self-Service Documentation Access](#), industry's leading web based automated tools, where you can access product and compliance documentation online, including: Conflict Minerals Declaration, Conflict Minerals Reporting Template (CMRT), Data Sheets (Part Number Specific), EOL Statements, IBIS Models (oscillators only), IPC-1752 Material Declarations (pdf/xml), Qualification and Reliability Reports (MTTF), REACH Statements, and RoHS Certificates.