



ROHS COMPLIANCE

White Paper

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Summary

Lexar has completed product and process qualification for RoHS compliant products. Lead based soldering processes have been replaced by Tin/Ag/Cu based solder in the manufacture of compliant products. RoHS compliant products and processes are carefully segregated from non-RoHS compliant materials and processes. RoHS compliant products will be available for shipment to EU locations in June 2006 and to other worldwide locations by mid-October 2006. Reliability and other testing results are available upon request from Lexar.

Introduction.

Lexar is a leading manufacturer and marketer of NAND flash memory products including memory cards, USB Flash Drives, card readers, and ATA controller technology solutions for digital photography, consumer electronics, industrial and communications markets.

Lexar supports the recent initiatives for “Green” manufacturing requirements designed to protect the environment from additional contamination by Lead (Pb) and other hazardous substances. With the passage of legislation by the European Union (EU) in 2003, Lexar has applied these requirements in the development of new products and manufacturing processes that are compliant with the European Commission Directive (2002/95/EC RoHS).

This communication has been written to address the following concerns that our customers may have regarding Lexar’s RoHS compliance programs:

- Are there any significant changes in the materials used in the manufacture of Lexar’s RoHS compliant products?
- How were the products and manufacturing processes tested and qualified as RoHS compliant material?
- Can Lexar provide RoHS compliant products when I need them?
- Who should I contact if I need more information?

Material Used in Lexar’s RoHS compliant Products

Major components used in Lexar products, such as the memory and controller IC’s, have been RoHS compliant since January of 2006. The removal of Lead (Pb) from Lexar’s products is having the greatest impact on the manufacturing assembly processes where Lead was a commonly used component in the solder paste formulation used to bond the components to the circuit board and provide electrical contact to the circuits. The low melting temperature of lead based alloys allowed the use of lower manufacturing processing temperatures for the reflow (melting) process of the solder.

Lexar's RoHS compliant products are now processed with a tin based solder formulation containing a small amount of Silver (Ag) 3.0% and Copper (Cu) at 0.5%. Processing temperatures used to reflow the new Pb-free solder formulations have been adjusted higher (260 +/- 5 degrees Centigrade) to provide reliable component bonding and electrical connections. This formulation and processing temperature is now widely used in the electronics industry for producing RoHS compliant products.

RoHS compliant passive components such as resistors, capacitors, crystals, and connectors have replaced the non-compliant versions used in the past. New part numbers have been assigned to the products at the manufacturing assembly level to provide the ability to distinguish RoHS compliant products from older non-compliant versions.

Testing of Lexar's RoHS Compliant Products

Lexar's RoHS compliant products have been tested for both reliability and compliance to the new limits on hazardous materials. Reliability testing was conducted to confirm that the changes in the manufacturing soldering process would provide product reliability to meet Lexar's requirements. This testing included thermal shock and high humidity exposure of the product. Details can be found in Lexar report #MS-Qual-4Q.

Lexar's RoHS compliant products meet the limits on hazardous substances shown in Appendix B and have passed Lexar's reliability and functional testing. Compliance certification documentation for Lexar's RoHS products is available upon request. A sample of this certification documentation is included in Appendix C of this publication.

Availability of RoHS products

Most Lexar products can now be manufactured in a RoHS compliant configuration. Conversion of assembly lines is in progress and will be completed in time to ship RoHS compliant products to EU countries before July 1, 2006. RoHS compliant production lines are segregated from Lead containing production lines. A high level of control is in place to assure that customers receive the RoHS compliant products that have been ordered. Shipments of RoHS compliant products to locations outside of the EU countries will commence once the initial requirements for European locations has been satisfied. Lexar plans to have 100% conversion to RoHS compliant products for all worldwide locations by mid October 2006.

Conclusion

Lexar will provide RoHS compliant materials for shipments to EU locations commencing in June 2006 and to other worldwide locations by October 15, 2006. These materials have been fully tested for reliability and compliance with European Union Directives 2002/95/EC (RoHS). Customers are encouraged to contact the Lexar account manager for scheduling and any additional product availability information. The Lexar Corporate Quality Organization is also available to provide you with additional information regarding reliability or compliance testing performed on Lexar's products that you may require.

Appendix A

Maximum Concentration Value (MCV) in Homogeneous Materials¹ of RoHS Restricted Substances

Mercury	0.1% by weight	1000 ppm
Cadmium	0.01% by weight	100 ppm
Lead	0.1% by weight	1000 ppm
Chromium (VI)	0.1% by weight	1000 ppm
PBB ²	0.1% by weight	1000 ppm
PBDE ³	0.1% by weight	1000 ppm

1. Homogeneous material refers to a material that cannot be mechanically separated into different materials.
2. PBB – Polybrominated Biphenyl Compounds
3. PBDE – Polybrominated Biphenyl Ether Compounds

Appendix B
Sample RoHS Compliance Letter

RE: RoHS Certification: Lexar Media Business Unit Production Line

Lexar Media certifies that our Pb-free products meet the requirements of the current DIRECTIVE 2002/95/EC, a.k.a. Restriction of Hazardous Substances (RoHS) Directive without exemptions. Lexar's Pb-free products mentioned above contain less than the following amounts of the six RoHS banned substances:

- Less than 0.1% Lead – Pb
- Less than 0.1% Mercury – Hg
- Less than 0.01% Cadmium – Cd
- Less than 0.1% Hexavalent Chromium – Cr (VI)
- Less than 0.1% Polybrominated Biphenyls - PBB
- Less than 0.1% Polybrominated Diphenyl Ethers - PBDE

Please note that many of our products do contain electronic ceramic passive parts that may use lead-oxides which are exempt from Directive 2002/95/EC (see Article 4, Section 2 and Section 7 of the Annex thereto).

The information provided above, applies to all Lexar products.

Further questions should be addressed to your local Lexar sales representative.

Sincerely,

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