



Customer Information	ERNI roadmap for compliance with the RoHS for "lead free" connectors	ERNI Marketing Sept. 2005
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The basis is the

Richtlinie des Europäischen Parlaments und des Rates zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten

or

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

better known as Restriction on Hazardous Substances (RoHS)

and also

Elektro- und Elektronikgerätegesetz – ElektroG
of 16. March 2005
which regulates the national conversion
of european directives 2002/95/EG and 2002/96/EG.

Validity:

1 July 2006

Extract from Article 4 Paragraph 1

"The member states shall ensure that after 01 July 2006, newly marketed items of electrical and electronic equipment shall not contain any lead, mercury, cadmium, hexavalent chromium, polybromide biphenyl (PBB) or polybromide diphenyl ether (PBDE)."

These materials are prohibited because they demonstrably cause damage to people and to the environment. The electronics industry is particularly affected by the ban on lead.

Up until now various investigations have been carried out by different institutions, working parties, etc., which have developed alternative material processes to ensure the "lead-free" manufacture of electrical/electronic equipment after 01 July 2006.

This document is intended to inform our customers of the ERNI strategy in order to be able to plan accordingly.

To define the process, we will differentiate between new developments and current products.

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1 New developments

All new developments of connectors for the standard range **will in general be carried out using lead-free connector technology (pure tin)** and are therefore already RoHS compliant.

As for plastics molding material the following flame retardants are used in accordance with the EC directive 2002/95/EG and 2003/11/EG:

- polybutylene terephthalate (PBT) - antimony trioxide and bromine compounds
- polyamide (PA) - antimony trioxide
- liquide crystal polymer (LCP) - without brominated flame retardants.

This relates to all types of connector such as SMD (**S**urface **M**ount **D**evice), THR (**T**hrough **H**ole **R**eflow) and pressfit.

The materials, i.e. the insulating bodies, of these products are designed with regard to their temperature loading capability so that they withstand the lead-free soldering processes without damage.

Nickel will continue to be used as a barrier layer for the contact surface. Pure tin with a nickel barrier layer will be used for the surface on the connector side.

State-of-the-art whisker-free or low-whisker baths which are also called upon by the competition are used.

The surface used is backwards-compatible, i.e. both tin-lead solder and lead-free solder (SnCu, SnAg or SnCuAg) can be used.

There are no limitations with regard to function and processing for pressfit technology.

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2 Current products

2.1 Pressfit connectors

A successive change over will take place for the current products. Pressfit connectors do not have to withstand soldering temperatures. Only the contact surface will be designed to be lead-free (pure tin). After the conversion to lead-free the connectors will be RoHS compliant with exception of the parts in stock. As for plastics molding material the following flame retardants are used in accordance with the EC directive 2002/95/EG and 2003/11/EG:

- polybutylene terephthalate (PBT) - antimony trioxide and bromine compounds
- polyamide (PA) - antimony trioxide
- liquide crystal polymer (LCP) - without brominated flame retardants.

The item numbers (customer order numbers) will not be changed and the stock will be replaced or used up by using the FIFO (first in, first out) principle.

New item numbers will be assigned internally for the lead-free contact strips so that clear identification is possible based on the manufacturing date to ensure full traceability.

It is possible that mixed deliveries will occur in the transition phase. In this phase, a clear label will be attached to all lead-free products.

Delivery of the lead-free design for pressfit connectors will start in the second quarter of 2004.

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2.2 Standard solder connectors

Into this category come all connectors that are soldered but with regard to the insulating body are not suitable for the lead-free reflow processes with increased temperature load.

However, these connectors are suitable for both lead and leadfree wave soldering.

A pure tin surface, as described under Item 1, will be used for the contact surfaces. After the conversion to lead-free the connectors will be RoHS compliant with exception of the parts in stock. As for plastics molding material the following flame retardants are used in accordance with the EC directive 2002/95/EG and 2003/11/EG:

- polybutylene terephthalate (PBT) - antimony trioxide and bromine compounds.

The item numbers (customer order numbers) will not be changed and the stock will be replaced or used up by using the FIFO (first in, first out) principle.

New item numbers will be assigned internally for the lead-free contact strips so that clear identification is possible based on the manufacturing date to ensure full traceability.

It is possible that mixed deliveries will occur in the transition phase.

Delivery of the lead-free design for standard solder connectors will start in the second quarter of 2004.

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2.3 Connectors with "lead-free process capability"

All solder connectors, which are compatible with the lead-free reflow - soldering process (increased soldering temperature), fall into this category. The insulating body is made from a high temperature material (e.g. LCP) and the connecting surfaces are designed to be lead-free. After the change over to lead-free the connectors will be RoHS compliant with exception of the parts in stock.

As for the high temperature material the following flame retardants are used in accordance with the EC directive 2002/95/EG and 2003/11/EG:

- polyamide (PA) - antimony trioxide
- liquide crystal polymer (LCP) - without brominated flame retardants.

A pure tin surface, as described under Item 1, will be used for the contact surfaces.

The item numbers (customer order numbers) will not be changed and the stock will be replaced or used up by using the FIFO (first in, first out) principle.

New item numbers will be assigned internally for the lead-free contact strips so that clear identification is possible based on the manufacturing date to ensure full traceability.

It is possible that mixed deliveries will occur in the transition phase.

Delivery of the lead-free design for connectors with "lead-free process capability" will start in the second quarter of 2004.

2.4 Customer specific products

Changes to customer specific products will be made exclusively at the request of and in agreement with the customer.



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3 Summary

All ranges of connectors will be available in lead-free (pure tin) design by the beginning of 2006.

Concerning the insulating body it is necessary to distinguish between:

- Connectors with lead-free contact surface and
- Connectors with lead-free contact surface and higher temperature resistance for lead free reflow soldering processes.

For reasons of existing compatibility and immense administrative outlay on the part of ERNI and ERNI customers, the item numbers of the current series will be retained.

Many of ERNI connectors referable to the insulating body are already designed and released for higher lead-free soldering temperatures up to 260°C. Connectors which do not achieve the requirements for higher soldering temperatures will be replaced by appropriate versions upon request. This will create a new item number for full traceability to avoid connector mixing.

The objective is a customer-oriented implementation of the RoHS which comes into force on 1 July 2006. Above all, along with the minimization of technical risks, in today's economic environment, customer-oriented means the ability to calculate costs.

Since 2004, current ERNI standard products are being converted to lead free connector technology. The change will be completed by the end of 2005. The proceeding will be specific according to the product range.

Both, lead and lead free products will be delivered during the transition period until the end of the year 2005.

From January 2006 only RoHS compliant parts will be shipped, exempted are parts with special customer agreements.

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4 FINAL REMARKS:

Technology:

ERNI recommends matt-finish lead-free connector technology. The advantages compared to the polished/flashiness lead free technology are as follows:

- improved solderability and shelf life respectively,
- less affinity to whisker formation.

To assure the advantages, Nickel will continue to be used as a barrier layer for the contact surface. Especially for pure tin coating the Nickel barrier layer thickness has been increased.

Costs:

Here, it should be stated once more that, in the transition phase, the limited availability of the processes will temporarily cause costs to rise. A lasting cost increase due to the use of high temperature materials is to be feared unless the demand for these plastics increases and the purchasing costs are reduced as a result. Increased costs may also result if certain components cannot be changed over to lead-free mass production techniques from a technical (no drop in material) and economic point of view (quantities too low). This will then mean extra soldering processes or Pressfit technology.

"Hidden" costs result mainly from administrative efforts. Therefore, from today's point of view, the item numbers should not be changed due to the compatibility. Changing the drawing (surface change) is considerably less expensive than changing the item number.

New item numbers will be set up for connectors with additional high temperature insulating bodies.

Identification:

A label identifies the packaging of connectors, when transition to leadfree of whole productline is finished. Depending on the of connector size and labeling technique the connectors will be signed with "RC" (RoHS compliant).

Notice:

ERNI reserves the right to make modifications in accordance with the state of the art or with requirements based on investigations and the results of tests without notification, provided that there are no adverse consequences for ERNI customers as a result.

This document is available to all our customers for information at our website www.erni.com/leadfree.