

DEVICE ENGINEERING INC.
Pb-Free / RoHS POLICY STATEMENT
JANUARY 2005

STATEMENT

Due to environmental concerns, the need for “Pb-free” and “Green” solutions in electronics components and systems is getting considerable attention within the electronics industry. Although one of our business segments, the Aerospace industry, is exempt from the current EU initiatives, we believe that an increasing percentage of our customers will require Pb-free parts over the next few years, and that the industry as a whole will ultimately switch to predominantly Pb-free solutions. DEI is committed to offer Pb-Free, RoHS compliant product options for all products, for all our customers both inside and outside the Aerospace industry.

DEFINITIONS

DEI terminology:

Pb-free = RoHS = Green

RoHS and WEEE are European Union (EU) Directives and stand for Waste Electrical and Electronic Equipment (WEEE) and for Restriction of the use of certain Hazardous Substances (ROHS). Among other things, these directives restrict the use of certain hazardous substances in electrical and electronic equipment shipped in to the EU as of July 1, 2006.

The substances identified by the WEEE Directive as hazardous are:

- Lead (Pb)
- Mercury
- Cadmium
- Hexavalent Chromium
- Polybrominated Biphenyl (PBB)
- Polybrominated Diphenyl Ether (PBDE)

‘Green’ products from DEI do not contain the substances banned in the RoHS / WEEE directive.

Pb-FREE STRATEGY

DEI intends to qualify and offer ‘Green’ parts for all products. The schedule for converting products to Green will be market driven. DEI will initially supply ‘Green’ product on a special-order basis, where the Green product must be specifically ordered with the addition of a “-G” suffix to the Part Number on the Customers Purchase Order. At some point, DEI will transition individual products to ‘Green’ status such that all parts, ordered “-G” or not, will be ‘Green’. Product Change Notices (PCN’s) will be issued at least 90 days prior to the transition.

DEI will accept orders for Green “-G” parts beginning 4Q05. Deliveries for “-G” parts can be scheduled for 1Q06. Conversions of specific products to Green will begin 3Q06.

Currently, DEI's lead-finish for plastic encapsulated microcircuits (PEM's) and most of the ceramic product is a Tin/Lead (SnPb) alloy. The plastic molding compound is characterized for 224 -240°C peak soldering temperature, typical of a SnPb soldering process.

To provide Green product, an appropriate Pb-free lead finish will be qualified for each package type. This will be NiPdAu for most packages. However, Matte-Sn may initially be the only option for some low-volume packages. In this case, DEI will offer the Matte-Sn finish for the limited “-G” special order basis, but will not convert the product to the “Green” status until the NiPdAu finish is available.

The new plastic molding compound and die attach materials will be required to withstand the higher soldering temperatures typical of Pb-free soldering (240 to 260°C). All materials will be “Green”, i.e.: compliant with the RoHS directive. All DEI “-G” and “Green” products will be capable of withstanding the higher soldering temperatures.

The 'Green' product will demonstrate equal or better reliability as compared to the current product.

DEI intends to eventually transition all of its standard products to 'Green' materials. For the convenience of our customers, there will be a transition period of at least four months from when the 'Green' product is introduced and available as a special order “-G”, to when it becomes the “Green” standard product offering. A Product Change Notice (PCN) will be issued to notify customers that the 'Green' product has been qualified, is available, and will become the standard product for deliveries beyond a defined time frame.

CURRENT STATUS

DEI product is assembled by several world class package assembly suppliers. They have completed the formulation and qualification of 'Green' materials for all applicable DEI plastic products, and are currently supplying a high volume of 'Green' product to the electronics industry. DEI is actively working with its suppliers to define the best 'Green' options for its products.

SnPb PRODUCTS

DEI intends to transition products to 'Green' status on a product-by-product basis. In cases where a customer cannot accept a change to the Green product, the SnPb product will be available by special order, which is Non-Cancelable, Non-Returnable (NCNR).

New DEI standard products released after 3Q05 will be introduced as 'Green' product only.

MSL RATING

All Pb-free surface-mount plastic packages will be classified or re-classified to the JEDEC J-STD-20 Moisture Sensitivity Level (MSL) for Pb-free process. This uses the higher temperature (245 to 260°C) criteria for classification. DEI's product data sheets and storage/shipping instructions will be revised to the new classifications.

The majority of the MSL ratings will remain unchanged from the current MSL classification. If there is a change in the MSL rating of a package, the customer will be notified and appropriate packing precautions will be taken before any product is shipped.

PRODUCT IDENTIFICATION

Order Entry:

A “Customer Option” suffix field will be added to the order entry part number to designate the “Green” option. This field allows the customer to order the ‘Green’ product as a special order before that product has been converted to “Green” status. After the conversion, all shipments of that product will be Green, regardless of suffix. This allows the customer to “do nothing”, and simply accept the transition to ‘Green’ product with no change to ordering. The customer option field code denotes the following:

- ‘-G’ denotes ‘Green’ product.
- A ‘blank’ field denotes the default standard product. This is currently ‘SnPb’ product. It will denote the ‘Green’ product for shipments after the PCN is effective.


For example, consider how to order the DEI1026-SES:

Prior to the PCN transition, the ‘Green’ part will be ordered as DEI1026-SES-G. The standard SnPb part will be shipped for orders placed as DEI1026-SES.

After the PCN transition, the ‘Green’ part can be ordered as DEI1026-SES-G, but will also be shipped for orders placed as DEI1026-SES.

Marking and Labeling:

The product marking and labeling of “Green” product will be according to JEDEC JESD97 ‘Marking, Symbols, and Labels for Identification of Lead (Pb) Free Assemblies, Components, and Devices’. For large parts where space allows, the mark will include the “Pb-free category” symbol: ex where “x” denotes the terminal finish, i.e.: e3 = Matte-Sn, e4 = precious metal (Au, NiPdAu). The -G “Customer Option” will not be marked on the part.

The label affixed to the bag or container-holding devices will include the DEI PN including customer option field “-G”. It also includes the “Pb-free” symbol , Pb-free category “ex”, and the new MSL rating and peak body temperature.

QUALIFICATION PLAN

Where appropriate, DEI will qualify the new package materials by similarity using the Assembler’s Package Qualification Report for each package type. These include data for the MSL characterization and reliability tests (Autoclave, Temperature Cycling, Thermal Shock, and High Temperature Storage) performed to qualify the package assembly materials and process. DEI will perform additional tests as appropriate.

DEI will also perform first article inspection tests of the initial assembly lot to verify correct construction.

AVAILABILITY

“Green” product will be available on special order basis for delivery 1Q06.