

NEC Pb-Free Semiconductors: Questions & Answers

Why the concern about lead?

Environmental Management has become an important factor in the production and delivery of semiconductor components to end users. The issues of controlling and minimizing waste in manufacturing has always been a consideration, but of growing concern is the disposal of obsolete and broken equipment.

Over 20 million pounds of lead solder is used annually, most of which finds its way into products that become obsolete within a couple of years. The most common means of disposal are landfills and incineration.

In landfills, lead leaches into the groundwater, eventually making its way into our drinking water supply and food chain. Incineration releases lead-based toxins directly into the air, where they are adsorbed through respiration. Incineration also creates toxic ash and slag which requires disposal — usually in landfills.

How will Pb-Free legislation affect your company?

Pb-Free legislation will affect each company differently, based upon the type of product, the geography served, and the technology involved. CEL can help you complete your company's effort to become Pb-Free with high-quality Pb-Free product and experienced technical support.

What is NEC doing?

NEC is making the switch to Pb-Free semiconductor devices and is committed to making the change as simple and painless as possible for its customers. Pb-Free

Lead exposure is most serious for young children because they absorb it more easily than adults and are more susceptible to its harmful effects. Even low level exposure can harm the physical and intellectual development, behavior, and hearing of infants. During pregnancy, especially in the last trimester, lead can cross the placenta and affect the unborn child. Female workers exposed to high levels of lead have more miscarriages and stillbirths.



Government and electronics industry groups worldwide have met to address these concerns and develop guidelines and legislation. While the U.S. trails the world in Pb-Free legislation, U.S. companies that sell products internationally should be aware of overseas regulations.

Please consult your environmental attorney or a qualified consultant to determine exactly how Pb-Free legislation affects your company and what steps should be taken to become compliant.

packaging started at NEC in 1999. The company now offers the majority of its products in Pb-Free versions.

How do these changes affect *your* NEC parts? SEE BACKSIDE...

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Pb-Free

How are NEC's products changing?

Pb is being eliminated from the leads and, where necessary, from the die bond in our packages. In some devices, package wall thickness has been increased to accommodate the higher temperatures Pb-Free solders require. NEC's MSL (moisture sensitivity) level ratings are unchanged.

Will there be any difference in performance specifications?

No.

Will there be any difference in price?

No.

Will I have to re-qualify my parts?

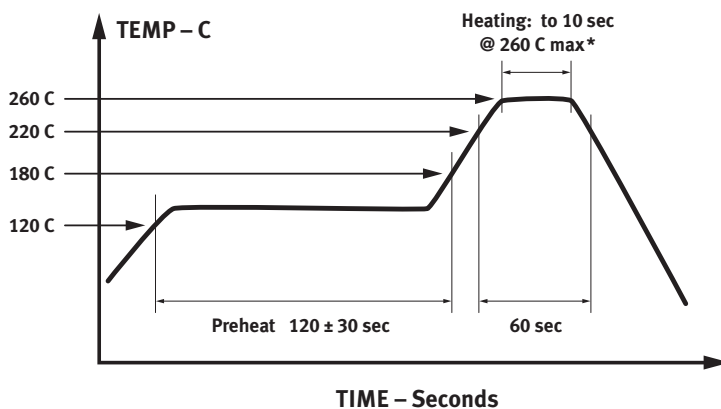
Probably not — unless it's required by your design program. Contact CEL if you have questions. With sufficient lead time, we can provide you with samples and packaging data.

Will there be any change in the NEC part number?

Yes. The base part number will remain the same, but an "-A" will be added as a suffix. For example, the Pb-Free version of the PS2501-1-F3 optocoupler will be PS2501-1-F3-A. "-AZ" will be added to devices that contain Pb, but are RoHS-compliant per Exemption 5. Contact your local CEL Sales Office for details.

Will I have to change my manufacturing process?

NEC Pb-Free parts are compatible with most existing solders and reflow profiles. Note that the preferred profile when soldering Pb-Free parts involves a longer pre-heat period, higher reflow temperatures, and longer time at full heat:



Preferred Reflow Process for Pb-Free Devices

- Longer preheat, to 150 seconds, max.
- Longer period over 220°C, to 60 seconds
- Higher peak temperature, to 260°C*

* A limited number of devices cannot withstand temperatures above 250°C. Please see specific data sheet for details.

When can I switch to Pb-Free NEC parts?

Whenever you're ready. CEL has a broad range of NEC Pb-Free devices available now.