

Environmental Compliance and RoHS Information

Nemco Electronics Tantalum Capacitors are 6/6 compliant with RoHS/RoHS 2.

Test Certificates and materials content information are available upon request.

Introduction:

In February of 2003 the European Union released The Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2002/95/EC) restricting the use of Lead, Cadmium, Mercury, Hexavalent Chromium and PBB/PBDE flame retardant materials in electrical and electronic products sold in Europe beginning July 1, 2006. The EU Directive was updated December 2006 to EU 2006/122/EC adding PFOs as a banned substance. On July 1, 2011, A June 8, 2011 new RoHS directive, 2011/65/EC ("RoHS 2") was announced in the Official Journal of the EU.

Measures on the collection, treatment, recycling and disposal of waste electrical and electronic equipment (WEEE) are set out in Directive (2002/96/EC) of January 2003 to reduce the waste management problems linked to the heavy metals and flame retardants referenced above.

Nemco's response to the growing demand for environmentally friendly components began January 2004 with the introduction of optional lead-free surface mount tantalum capacitors. All Nemco surface mount lead-free products comply to RoHS requirements. The conversion to lead-free involves changing the termination finish from a 90/10 Sn/Pb (tin/lead) finish to a 100% Sn matte tin finish.

Nemco's radial leaded dipped tantalum lead-free capacitors became available Q4/2004. The termination finish on lead wires for lead-free product will be 100% Sn matte tin. The internal joint for terminal attachment is changed from Sn/Pb/Ag (tin/lead/silver) to Sn/Ag/Cu (tin/silver/copper) solder.

All Nemco products are manufactured lead-free and RoHS compliant as of the full implementation dates of production changes. Nemco no longer manufactures products with 90/10 SnPb termination finish. During the conversion period Nemco provided for a suffix code (LF) to ensure lead-free product. This suffix code is no longer required.

The change to lead-free design has no negative effect in the electrical parameters, solderability, reliability or product performance.

Full Implementation dates of production changes

	Lead-free	RoHS Compliance
Surface Mount Devices (PCT, LSR)	01/01/2004	01/01/2004
Surface Mount Devices (MCT)	01/01/2005	01/01/2005
Surface Mount Devices (CGT)	09/01/2007	09/01/2007
Leaded Devices (TB)	01/01/2005	01/01/2005

The table below lists hazardous material content.

Presence of Restricted Ingredients within Homogenous Materials of Lead-Free Product								
Series	RoHS/Elv Status	Cadmium	Hexavalent Chromium	Lead	Mercury	PBBs	PBDEs	PFOS PFOA
	Limit	<0.01%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	0
PCT	Status	compliant	compliant	compliant	compliant	compliant	compliant	compliant
LSR	Status	compliant	compliant	compliant	compliant	compliant	compliant	compliant
MCT	Status	compliant	compliant	compliant	compliant	compliant	compliant	compliant
CGT	Status	compliant	compliant	compliant	compliant	compliant	compliant	compliant
TB	Status	compliant	compliant	compliant	compliant	compliant	compliant	compliant

The new EU chemicals regulation know as REACH came into effect June 1st, 2007. In the event a substance of very high concern (SVHC) becomes present in one of our products Nemco will notify customers as required.

Nemco devices are free of Halogens (Flourine, Chlorine, Bromine and Iodine), Antimony and Phosphorous.

All Nemco products meet environmental compliance requirements in accordance with the following:

- Ban on PFoS / PFoA
- Ban on DECA-BDE
- China RoHS
- IPC/JEDEC, J-STD-020B
- IPC/JEDEC, J-STD-20C
- JEA
- JEDEC, JESD97
- JEDEC, JESD D22-B102D
- JIG Level A & B
- REACH, EC1907/206
- RoHS, EU Directive 2002/95/EC
- RoHS, EU Directive 2006/122/EC
- TSCA, Toxic Substances Control Act 1976

IPC/JEDEC Moisture Sensitivity Level (MSL) addresses the subject of moisture absorption and retention inside the component. The trapped moisture can vaporize and exert tremendous external stresses when the device is subjected to sudden elevated temperature such as board mounting. Package cracking due to such moisture induced stresses is known as popcorn cracking. Surface mount devices are generally more prone to popcorn cracking. IPC/JEDEC defined a standard classification of moisture sensitivity levels representing vulnerability of the package to popcorn cracking. MSL level 1 corresponds to packages that are most immune to popcorn cracking regardless of exposure to moisture. MSL level 6 corresponds to packages that are most prone to moisture-induced fracture.

MSL - Level 1: PCT, LSR, MCT, TB

MSL - Level 3: CGT

IPC/JEDEC J-STD-20 MSL level 1 Classification

- Floor Life
 - Time: Unlimited
 - Condition - Degrees (Celsius) / Relative Humidity: $\leq 30^{\circ}/85\%$

- Soak Requirements (standard)
 - Time (hours): 168 +5/-0
 - Condition - Degrees (Celsius) / Relative Humidity: $85^{\circ}/85\%$

- Soak Requirements (accelerated)
 - Time (hours): N/A
 - Condition - Degrees (Celsius) / Relative Humidity: N/A

Nemco lead-free devices are in accordance with JEDEC Standard JESD97 category e3 terminations.

Storage and Handling

RoHS compliant components will have the same storage and handling requirements as non-compliant parts.

Compatibility

RoHS compliant components are backward compatible with existing leaded/non-compliant components.

Board Redesign

RoHS compliant components do not require board redesign (i.e. different footprint etc.).

Organizations/Associations

North America:

- **EIA** - <http://www.eia.org/>
(Electronic Industry Association)
- **IPC** - <http://www.ipc.org/>
(Interconnect and Packaging of Electronic Circuits)
- **NEMI** - <http://www.nemi.org/>
(National Electronics Manufacturers Initiative)

Asia:

- **JEITA** - <http://www.jeita.or.jp/>
(Japan Electronics and Information Technology Industries Association, formerly JEIDA)
- **JIEP** - <http://www.jeita.or.jp/>
(Japanese Institute of Electronic Packaging)

Europe:

- **European Commission** - <http://europa.eu.int/>



James Rapoport – RoHS coordinator