

Texas Instruments Semiconductor Lead (Pb)-Free Program Committed to Achieving Lead-Free and RoHS Compatibility

Texas Instruments (TI) is an industry leader in the movement to lead (Pb)-free. TI defines lead (Pb)-free or Pb-free to mean RoHS compatible, including a lead concentration that does not exceed 0.1% of total product weight and, if designed to be soldered, is suitable for use in specified lead-free soldering processes.

On January 27, 2003, the European Union passed the *Restriction on Use of Hazardous Substances in Electrical and Electronic Equipment*, or RoHS legislation 2002/95/EC, which becomes effective July 1, 2006. TI recognizes that customers require early availability of Pb-free products, and TI has set an aggressive schedule for Pb-free conversion in response to customers' needs, planning to have the majority of TI products available Pb-free by the end of 2004.

Lead-Free Conversion Overview

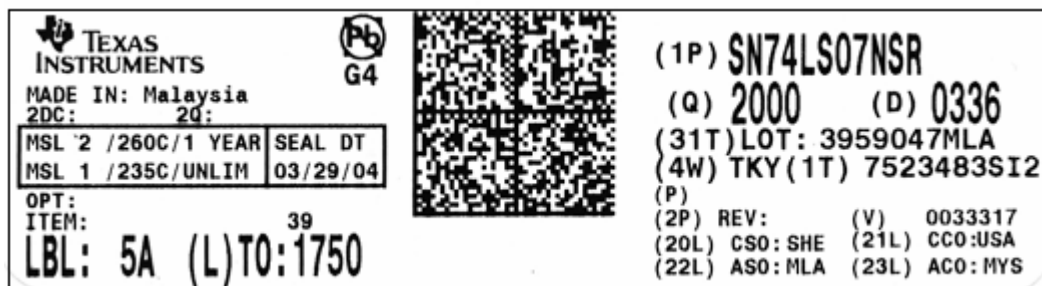
TI is nearing full RoHS compatibility. Small amounts of lead commonly have been used in integrated circuits for many years. During the late 1980s, TI began an initiative to convert its products to lead-free alternatives.

Today, TI's integrated circuits meet the proposed RoHS thresholds for cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs). Most of our integrated circuits also meet the proposed thresholds for lead, with the remaining devices on a near-term schedule for qualification and availability. This status is based on TI's current understanding of RoHS and TI's knowledge of the materials that go into its products.

For more information on specific packages or part numbers, refer to www.ti.com/leadfree.

Lead (Pb)-Free Logo

After June 1, 2004, TI will begin shipping Pb-free capable integrated circuit (IC) components using packing labels that align with Joint Electronic Device Engineering Council (JEDEC) standards. TI began using a Pb-free logo on packing labels in 2003 for devices that utilize both a Pb-free finish and a material set rated for use in lead-free reflow processes. TI's new JEDEC-compliant label will continue to reflect these markings for applicable devices.



Example of TI's JEDEC-compliant packaging label with the lead (Pb)-free logo and MSL rating

Devices marked with a Pb-free logo are compatible with the proposed RoHS thresholds for all substances, including lead (Pb).

The following table shows a substance list, with corresponding information about TI's RoHS compatibility status.

RoHS Substance List and TI Status			
Substance	Threshold	Status of TI's Integrated Circuits	Documents
Lead	0.1% per weight	Majority are compatible, check product content by device name	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide 2. European Commission proposed amendment to RoHS issued December 2003; 1000 ppm homogeneous material threshold.
Cadmium	75ppm* 100ppm*	Compatible	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide: threshold = 75ppm* 2. European Commission proposed amendment to RoHS issued December 2003; 100 ppm homogeneous material threshold.
Mercury	0.1% per weight	Compatible	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide 2. European Commission proposed amendment to RoHS issued December 2003; 1000 ppm homogeneous material threshold.
Hexavalent chromium	0.1% per weight	Compatible	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide 2. European Commission proposed amendment to RoHS issued December 2003; 1000 ppm homogeneous material threshold
Polybrominated biphenyls (PBB)	0.1% per weight	Compatible	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide 2. European Commission proposed amendment to RoHS issued December 2003; 1000 ppm homogeneous material threshold.
Polybrominated diphenyl ethers (PBDE)	0.1% per weight	Compatible	1. Joint EIA/EICTA/JGPSSI Industry Material Composition Declaration Guide 2. European Commission proposed amendment to RoHS issued December 2003; 1000 ppm homogeneous material threshold.

* Current documents conflict on threshold allowable. TI is compatible with the lower threshold.

Green Conversion

In addition to the RoHS substances, TI is addressing additional substances of concern through our "Green" mold compound initiative. TI defines Green to mean lead (Pb)-free and, in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb), above 0.1% of total product weight.

Today, Br and Sb are key components of the flame-retardant systems in most IC molding compounds used by the semiconductor industry, including TI. In response to environmental concerns, most mold compound suppliers began formulating mold compounds with alternative flame-retardant systems several years ago.

TI does not supply IC components that use a mold compound containing inorganic (red) phosphorous as an alternative flame-retardant system. The company currently is working with strategic mold compound suppliers to develop Green mold compounds with industry-accepted flame-retardant systems. TI plans to introduce these new materials, beginning in 2004.

If you have questions about this program, please visit our web site at www.ti.com/quality or contact your TI Account Manager.

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