

## **NXP Semiconductors List of Restricted Substances in Products**

Articles (*i.e.* materials, components, subassemblies, products) delivered to and used in NXP Semiconductors must be free of the "Restricted substances" as mentioned in this list.

### **A: Restricted Substances**

<b>Substances</b>	<b>Declaration Threshold ppm (mg/kg)</b>
Asbestos (all types)	10
Benzene ( <i>see remark e</i> )	5
Beryllium (and compounds)	1000
Cadmium and Cadmium compounds (in plastics)	20
Cadmium and Cadmium compounds (in metal alloys) ( <i>see remark a</i> )	100
Chlorinated paraffins (CP) ( <i>see remark h</i> )	1000
Chlorobenzene ( <i>see remark e</i> )	100
Formaldehyde ( <i>see remark e</i> )	0.1
Hexavalent Chromium (Cr 6+) and Cr (6+) compounds	1000
Lead and Lead compounds ( <i>see remark b</i> )	1000
Mercury and Mercury compounds	20
Monomethyl tetrachlorodiphenyl methane (Ugilec 141)	10
Monomethyl dichlorodiphenyl methane (Ugilec 121 or Ugilec 21)	10
Monomethyl dibromodiphenyl methane (DBBT)	10
Organostannic compounds ( <i>see remark f</i> )	1000
Ozone depleting substances ( <i>see remark c</i> )	1
Pentachlorophenol (PCP) and its salts and esters	10
Polychlorinated biphenyls (PCBs)	10
Polychlorinated naphthalenes (PCN) ( <i>see remark g</i> )	10
Polychlorinated terphenyls (PCTs)	10
Polybrominated diphenyl ethers (PBDEs) ( <i>see remark d</i> )	1000
Polybrominated biphenyls (PBBs)	1000

- a. The restriction does not apply to exemptions in European Directive RoHS (2002/95/EC).
- b. Lead-based soldering in electronic circuit boards and other electric applications is exempted in automotive applications under the European ELV directive (2000/53/EC).
- c. Ozone depleting substances, as published in 2000 in the Montreal protocol on substances that deplete the ozone layer: CFCs (Chlorofluorocarbons), HCFCs (Hydrogenated chlorofluorocarbons), Halons, Methyl Bromide, HBFCS (Hydrobromofluorocarbons), 1,1,1-Trichloroethane, Carbon tetrachloride and bromochloromethane.
- d. Polybrominated diphenylethers (PBDE) are the same as polybrominated biphenylethers (PBBE); polybrominated diphenyloxides (PBDO) are the same as polybrominated biphenyl oxides (PBBO).
- e. As residue in materials
- f. Organic Tin compounds (TBT, TPT and TBTO), applied in paints and as pigments and as agents for anti-oxidizing, anti-bacterial, anti-fungal, anti-septic, anti-staining and anti-fouling.
- g. > 3 Cl atoms; applied as stabilizer and flame retardant in plastics
- h. (C10-C13); applied in paints and as flame retardant in PVC

### **B: Additionally Restricted Substances in product packaging**

<b>Substances</b>	<b>Declaration Threshold ppm (mg/kg) <sup>1</sup></b>
Arsenic compounds, applied for wood packaging	10
PVC and PVC blends ( <i>see remark i</i> )	1000
Sum of Heavy metals (Cd, Hg, Cr(6+) and Pb)	100

- i. IC packing is exempted

<sup>1</sup> Above this declaration threshold the substance is restricted and declaration of the substance is obliged. In fact, restricted substances are not to be intentionally used, that is, NXP Semiconductors accepts that certain materials contain a certain amount of naturally occurring restricted substances. Thresholds can represent legal limits, or refer to currently accepted analysing thresholds. Furthermore these thresholds should be declared on component level. Substances are measured in homogeneous materials. Exemptions of specific applications, mentioned in legislation, are also exempted in our company. Nevertheless declaration is still needed.

**C: Additionally Restricted Substances when used in specific applications**

Substances	Declaration Threshold ppm (mg/kg) <sup>1</sup>	Remark
Azocolourants	30	Only in direct and prolonged skin contact applications, when e.g., applied in leather and textiles
Tris-(1-aziridiny) phosphinoxide	10	
Tri-(2,3-dibromo-propyl) phosphate	10	
Nickel and nickel alloys	0,5µg/cm2/week	Only in direct and prolonged skin contact applications
Phthalates	1000	Only in direct and prolonged skin contact applications applied in toys and childcare articles
Phenol an Phenolic compounds (see remark j)	50 mg/l	Applied in toys and childcare articles and laminates of printed wiring boards
Polycyclic aromatic hydrocarbons (PAHs)	50	Applied in applications, such as potting material for electronic ballast
Short-chain chlorinated paraffins	1000	(C10-C13); applied in paints and as flame retardant in PVC

j. Requirements for phenol in laminates of printed wiring boards:

- Smell Emission: <200 odor unit/m2/day  
Test method: Measured in duplo according to NVN2820 (or NEN-EN 13725:2003) by SGS Arnhem, the Netherlands, with 10dm2 of single sided copper clad laminate after 3 days at room temperature in a PTFE bag of approximately 40 l.
- Phenol monomer: <50 mg/l phenolics  
Test method: Phenolics content in water (according to ISO 6439) after shaking for 23 hours a mixture of 75 g of milled (to 3 mm) laminate in 1.5 l. of demineralized water at pH 4).

**1. Revision sheet**

DOCUMENT AUTHOR	REVISION DATE	CHANGE DESCRIPTION	DOCUMENT OWNER
Environmental Officer	2006-11-10	Change of Company Restricted into Company Confidential according UN-D 1596	Environmental Officer
Environmental Officer	2006-11-10	This document is completely modified acc. the new home rules of the new NXP Company	Environmental Officer
Environmental Officer	2007-01-25	Added chapter C: 'Additionally Restricted Substances when used in specific applications'.	Environmental Officer