

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

| Substances | Declaration Threshold ppm (mg/kg) |
|---|--------------------------------------|
| 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

| Substances | Declaration Threshold ppm (mg/kg) ¹ |
|---|---|
| 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

¹ 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) ¹ | Remark |
|---|--|--|
| Azocolourants | 30 | Only in direct and prolonged skin contact applications, when e.g., applied in leather and textiles |
| Tris-(1-aziridiny) phosphin oxide | 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 |
| Action PDCoding | 2007-09-20 | Change of Company Confidential into Unclassified | Environmental Officer |
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