

### Specified Chemical Substances Table

The survey covers a total 27 substances as specified below prohibited substances and controlled substances.

Please note that this list is reviewed on an ongoing basis considering the legal and social requirements, and that specified chemical substances are sometimes added to or removed from this list.

Classification	No.	Substance	Target Items and Applications	Regulation Value		
Prohibited Substances	1	Tributyl Tin Oxide (TBTO)	Coating, pigments	Prohibition of intentional use and less than 1000ppm		
	2	Tributyl Tins (TBTs), Triphenyl Tins (TPTs)	Stabilizers, antioxidants, age resisters	Prohibition of intentional use and less than 1000ppm		
	3	Polychlorinated Biphenyls (PCBs)	Insulating oil, Lubricating oil, fire retardants	Prohibition of intentional use		
	4	Polychloronaphthalenes (Cl=3 or more)	Lubricating oil, coatings, resin stabilizers, fire retardants	Prohibition of intentional use		
	5	Polychlorinated Terphenyls (PCT)	Lubricating oil, coatings, antiseptics	Prohibition of intentional use		
	6	Short Chain Chlorinated Paraffins	Fire retardants, plasticizers	Prohibition of intentional use		
	7	Asbestos	Electric insulation, bulking agents, gaskets	Prohibition of intentional use and less than 1000ppm		
	8	Azo Dies and Pigments that Generate Specific Amines	Pigments and colorants for electric wire coatings * Limited to sections in continuous contact with the human body	Prohibition of intentional use and less than 30mg/Kg (30ppm) when used as specific amines		
	9	Ozone-Depleting Substances	Cooling Medium	Prohibition of intentional use		
	10	Radioactive Substances	Packing, packaging materials	Prohibition of intentional use		
	11	Formaldehyde	Fiberboard, wooden products	Aerial concentration of less than 0.1ppm		
	6 RoHS Directive Substances	12	Cadmium and Cadmium Compounds	Cadmium contained in alloys with zinc content (brass, zinc die cast, lead-free solder, etc.), plating, plastic, rubber, coating, etc.	Prohibition of intentional use and less than 75 ppm*1	
		13	Lead and Lead Compounds	Exemptions	Lead contained in all types of alloys, solder, and all items other than those which are exempted	Less than 1,000 ppm
					Lead contained in steel materials	0.35wt% (3,500 ppm) or less
					Lead contained in aluminum alloys	0.4wt% (4,000ppm) or less
					Lead contained in copper alloys	4wt% (40,000ppm) or less
					Solder with a lead content of at least 85%	-
14		Mercury and Mercury Compounds	Mercury contained in all items aside from small fluorescent light bulbs and straight-tube fluorescent light bulbs	Prohibition of intentional use and less than 1,000 ppm		
15	Hexavalent Chromium Compounds	All hexavalent chromium in chromate treatment, plating, coating, etc. Chromium metal and chrome in metal alloys are exempted.	Prohibition of intentional use and less than 1,000 ppm			
16	Polybrominated Biphenyls (PBBs)	All PBBs including those in fire retardants	Prohibition of intentional use and less than 1,000 ppm			
17	Polybrominated Diphenyl Ethers (PBDEs)	All PBDEs including those in fire retardants	Prohibition of intentional use and less than 1,000 ppm			
Controlled Substances	18	Antimony and Antimony Compounds	Pigments, coatings, lead-free solder, etc.	Prohibition of intentional use and monitoring of the data on substances whose concentration exceeds 1000 ppm		
	19	Arsenic and Arsenic Compounds	Pigments, coatings, dyes, fire retardant			
	20	Beryllium and Beryllium Compounds	Ceramics, alloys, catalysts, and solder			
	21	Bismuth and Bismuth Compounds	Glass, lead-free solder, easy-cutting aluminum materials			
	22	Nickel and Nickel Compounds	Plating, coatings, pigments (alloys are exempted)			
	23	Selenium and Selenium Compounds	Pigments, coatings			
	24	Other Brominated Flame Retardants (other than PBBs and PBDEs)	Fire retardants			
	25	Phthalate esters	Plasticizers, pigments, dyes, coatings, adhesives			
	26	Polyvinyl Chloride (PVC)	Resins, cord sheathing, plasticizers			
	27	Other chlorinated organic compounds	Fire retardants, plasticizers			

\*1 Less than 100 ppm under the RoHS Directive

1. The regulation values are not for intentional additives, but rather stipulate the maximum permitted concentrations allowed for the impurities which are contained in homogeneous materials that cannot be mechanically separated.

2. If substances that are not included in this table are regulated by treaties, laws, ordinances, or industry guidelines, and other rules, these regulations shall be observed.

3. For exemption, items are listed in [Exempted Items List].

### Controlled Values of Prohibited Substances

The controlled values of the following prohibited substances are equivalent to concentrations that would not normally be exceeded without intentional uses, and used for controlled purposes in our company and suppliers.

In the event the concentration of a prohibited substance exceeds the controlled value, the supplier is required to reduce the concentration to a level below the controlled value.

Prohibited Substance	Applicable part/material		Controlled Value
Cadmium	<ul style="list-style-type: none"> <li>• Resin (including Rubber, film)</li> <li>• Coatings, inks, pigments, dyes</li> </ul>		Less than 5ppm (High-precision analysis method) (in state with no volatile elements)
	Lead-free solder	<ul style="list-style-type: none"> <li>• Bar solder</li> <li>• Wire solder</li> <li>• Resin flux cored solder</li> <li>• Solder paste</li> <li>• Solder ball</li> </ul>	Less than 20ppm (High-precision analysis method)
Lead	<ul style="list-style-type: none"> <li>• Resin (including Rubber, film)</li> <li>• Coatings, inks, pigments, dyes</li> </ul>		Less than 100ppm (High-precision analysis method) (with no volatile elements)
	Lead-free solder	<ul style="list-style-type: none"> <li>• Bar solder</li> <li>• Wire solder</li> <li>• Resin flux cored solder</li> <li>• Solder paste</li> <li>• Solder ball</li> </ul>	Less than 500ppm (High-precision analysis method)
		<ul style="list-style-type: none"> <li>• Soldered sections of purchased PC boards</li> <li>• Component solder</li> </ul>	Less than 1000ppm (High-precision analysis method)
	Metal materials other than lead-free solder		Less than 500ppm
	Glass(limited to uses in lamps)		
	Electroless nickel plating		Less than 800ppm (High-precision analysis method)
	Lead-free solder in a flow-solder bath		Less than 800ppm (High-precision analysis method)
Hexavalent Chromium	Chromate treatment parts/materials (based-layer zinc plating)		Less than 100ppm (Simple analysis method)
PBB PBDE	Resin (including Rubber, film)		Less than 100ppm (High-precision analysis method)
Lead, mercury, cadmium, hexavalent chromium	Packaging material  For each homogenous material comprising packaging (for example, resin, ink, paint)		Less than 100ppm (High-precision analysis method) of total quadruple heavy metals

## Exempted Items List

- 1) Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
- 2) Mercury in straight fluorescent lamps for general purposes not exceeding
  - halophosphate 10 mg
  - triphosphate with normal lifetime 5 mg
  - triphosphate with long lifetime 8 mg.
- 3) Mercury in straight fluorescent lamps for special purposes.
- 4) Mercury in other lamps not specifically mentioned in this Annex.
- 5) Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
- 6) Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminum containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
- 7) - Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing 85 % by weight or more lead),
  - lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications
  - lead in electronic ceramic parts (e.g. piezoelectronic devices).
- 8) Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC (1) amending Directive 76/769/EEC (2) relating to restrictions on the marketing and use of certain dangerous substances and preparations.
- 9) Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
- 10) Lead in lead-bronze bearing shells and bushes.
- 11) Lead used in compliant pin connector systems.
- 12) Lead as a coating material for the thermal conduction module c-ring.
- 13) Lead and cadmium in optical and filter glass.
- 14) Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight.
- 15) Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.