

**MANAGEMENT REGULATIONS FOR THE  
ENVIRONMENT-RELATED SUBSTANCES TO BE  
CONTROLLED WHICH ARE INCLUDED IN  
PARTS AND MATERIALS**

SS-00259 for General Use, Eighth Edition

**SONY**

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## 1. PURPOSE

With regard to the “Environment-related Substances to be Controlled (‘Controlled Substances’)” contained in the parts and devices employed in Sony electronics products, this Standard clarifies (1) banned substances, (2) substances to be phased out, and (3) exempted substances and their uses, in order to realize the following aims and objectives:

- 1) To prevent the above-mentioned substances from being used for Sony electronics products;
- 2) To comply with related laws and regulations;
- 3) To reduce the influence of the above substances upon the ecosystem; and
- 4) To contribute to the preservation of the global environment.

## 2. SCOPE

### 2.1 Scope applicable to parts and materials

Targets are the parts, materials, and other articles that are procured by the Sony group, or by third parties to which the Sony group outsources the design and manufacture of its electronics products.

The targets need to satisfy the criteria specified in this Standard.

Target parts and materials:

- Semi-finished products (e.g. modules, functional units, board assemblies, and other assembly parts)
- Parts (electrical parts, mechanical parts, semiconductor devices, PWBs, recording media, and packaging components and materials)
- Screws
- Accessories (mice, remote commanders, AC adaptors, and other accessories with which you can use products)
- Materials constituting subsidiary parts and materials (e.g. adhesives, adhesive tapes, soldering materials, etc.) used for products
- Printed materials (e.g. instruction manuals, warranty cards, additional product/parts information)
- Repair parts (The application of some repair parts for products on the market shall be followed the instructions on the separately issued notice.)
- Packaging components and materials that parts suppliers use for delivery and protection (See Section 4.2.1 “Definition of packaging components and materials” for details.)
- Batteries

### 2.2 Scope applicable to products

- 1) Sony electronics products that are designed and manufactured by the Sony group for sale, loan, or distribution
- 2) Sony electronics products being sold and loaned or distributed with the Sony group’s logos on them, whose design and/or manufacture are outsourced to third parties
- 3) Third parties’ electronics products whose design and/or manufacture are outsourced to the Sony group (except when the parts and materials are specified by the third parties)

Regarding the use of substances prohibited or restricted by regional or country laws and ordinances, the laws and ordinances must be observed and followed even though the substances and their uses are not clearly regulated in this Standard.

### 3. TERMS AND DEFINITIONS

In this Standard, terms are defined in the following manners.

- 1) “Environment-related Substances to be Controlled (‘Controlled Substances’)”  
Among the substances contained in parts and devices, “Environment-related Substances to be Controlled (‘Controlled Substances’)” are those which, according to Sony’s judgment, have significant environmental-impact on both humans and the global environment.
- 2) Management standards  
To manage the above-mentioned substances, the following Levels and Exemption are used:
  - a) Level 1  
The substances and their applications classified into this Level are those that are banned for the use in parts and materials.
  - b) Level 2  
On the date set in each table, the substances and their applications in the respective tables shall be reclassified into Level 1.
  - c) Level 3  
No effective date of the ban on the delivery is currently set for the substances and their applications classified into this Level. The ones under Level 3 shall be reclassified into Level 2 for banning the use of them in phases, depending on the availability of alternative parts or materials that satisfy the intended uses.
  - d) Exemption  
The substances and their applications classified as Exemption are those not regulated by or exempted from laws, or excepted from the ‘Controlled Substances’ because of the unavailability of adequate alternative parts and materials that satisfy the intended uses.
- 3) Contained  
“Contained” is a situation in which a substance is added to, is blended with, fills up, or adheres to:
  - a) The parts or devices employed in products, or
  - b) The materials used for the parts or devices, regardless if the situation is intentionally created or not.  
(When a substance is unintentionally contained in, or added to a product in a processing process, this situation is also regarded as “Contained.”)
 There are substances called Dopants (Doping Agents) that are intentionally added to manufacture semiconductor devices, etc. They are not treated as “Contained” if present in the devices in a very small amount.
- 4) Impurity  
An “Impurity” is a substance that satisfies either or both of the following conditions:
  - a) One contained in a natural material, which cannot be completely removed in a refining process by technical means (i.e. natural impurities); and
  - b) One generated in a synthesis process, which cannot be completely removed by technical means.
 There are substances called “impurities,” the name of which is used to distinguish them from main materials. If they are used for the purpose of changing the characteristics of a material, they are treated as “Contained.”  
  
 Note: The ‘Controlled Substance,’ which mingles with or adheres to parts or devices as an “Impurity,” must not exceed its allowable concentration specified in this Standard.
- 5) Effective date of the ban on the delivery  
This indicates the date on or after which Sony won’t accept the parts and/or materials specified in the corresponding columns of Table 4.2.
- 6) Plastics defined in this Technical Standard  
Plastics refer to materials and raw materials composed of synthetic high-molecular polymers in this Standard.  
More specifically, “plastics” mainly mean the following articles composed of synthetic high-molecular polymers: resins, films, adhesives, adhesive tapes, molded products, products made of synthetic rubber, and plastics made from raw materials of plant origin.  
When a natural resin is synthesized with any one of the above articles, the synthetic substance is a plastic.

#### 4. MANAGEMENT STANDARDS FOR “ENVIRONMENT-RELATED SUBSTANCES TO BE CONTROLLED”

##### 4.1 “Environment-related Substances to be Controlled (‘Controlled Substances’)”

The table below lists the “Environment-related Substances to be Controlled (‘Controlled Substances’),” defined in this Standard.

**Table 4.1 List of “Environment-related Substances to be Controlled (‘Controlled Substances’)”**

Substances	
Heavy metals	Cadmium and cadmium compounds
	Lead and lead compounds
	Mercury and mercury compounds
	Hexavalent chromium compounds
Chlorinated organic compounds	Polychlorinated biphenyls (PCB)
	Polychlorinated naphthalenes (PCN)
	Polychlorinated terphenyls (PCT)
	Short-chain chlorinated paraffins (SCCP)
	Other chlorinated organic compounds
Brominated organic compounds	Polybrominated biphenyls (PBB)
	Polybrominated diphenylethers (PBDE) (including decabromodiphenyl ether [DecaBDE])
	Other brominated organic compounds
Tributyltin compounds (TBT)	
Triphenyltin compounds (TPT)	
Asbestos	
Specific azo compounds	
Formaldehyde	
Polyvinyl chloride (PVC) and PVC blends	
Beryllium oxide	
Beryllium copper	
Specific phthalates (DEHP, DBP, BBP, DINP, DIDP, DNOP, DNHP)	
Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)	
Perfluorooctane sulfonates (PFOS)	
Specific benzotriazole	
Cobalt dichloride	
Ozone depleting substances (ODS)	

**Table 4.2 Main “Targets” and “Effective date of the ban on the delivery” regarding ‘Controlled Substances’**

Substances: Cadmium and cadmium compounds		
Targets		Effective date of the ban on the delivery
Level 1	<ul style="list-style-type: none"> <li>- Packaging components and materials (See 4.2.1.)</li> <li>- The stabilizers, pigments, or dyes used for plastics (including rubber) materials (e.g. labels, cabinets, phonograph records, cable tie, the keys of remote commanders, the outer plastic resins of electrical parts, and the insulators of electrical wiring)</li> <li>- Paints, inks</li> <li>- Surface treatment (e.g. electroplating, electroless plating, etc.) and coating</li> <li>- Photographic films</li> <li>- Fluorescent lamps (small-sized ones, straight-tube ones)</li> </ul>	Banned since the establishment of this Standard
	<p>All uses except those specified in Exemption Typical examples are given below:</p> <ul style="list-style-type: none"> <li>- Switches, relays, breakers, DC motors, and other electrical contact points</li> <li>- Fuse elements of temperature fuses</li> <li>- Glass, and the pigments as well as dyes of glass paints (paints for glass and the pigments as well as dyes used for glass)</li> <li>- Solder (whose cadmium concentration is more than 20 ppm)</li> <li>- CdS-photocells and the phosphors contained in fluorescent display devices</li> <li>- Resistor elements (glass frit)</li> </ul>	Banned since January 1, 2005
	<ul style="list-style-type: none"> <li>- Parts composed of metals containing zinc (e.g. brass, hot dip galvanizing, etc.) whose cadmium concentration is more than 100 ppm</li> </ul>	Banned since October 1, 2005
Exemption	<ul style="list-style-type: none"> <li>- Cadmium plating of electrical contacts, for which high reliability is required and which has no alternative materials</li> <li>- Cadmium in optical glass, filter glass</li> </ul>	N/A

<p>Test objects: plastics (including rubber), paints, and inks</p> <p>Allowable concentration: Less than 5 ppm</p>
<p>Standards for measurement</p> <p>1) Sample preparation</p> <p>Typical sample preparation methods are as follows.</p> <p>(1) Incineration under the existence of sulfuric acid (e.g. IEC 62321:2008)</p> <p>(2) A pressurized acid decomposition method done in a sealed container (a microwave decomposition method) (e.g. EPA 3052:1996, EN 13346:2000)</p> <p>(3) An acid decomposition method under the existence of nitric acid, hydrogen-peroxide water and hydrochloric acid (e.g. EPA 3050B Rev.2:1996)</p> <p>(4) A wet decomposition method under the existence of sulfuric acid, nitric acid, and hydrogen-peroxide water (e.g. BS EN 1122:2001)</p> <p>Note: In the process of sample preparation, precipitates must be completely dissolved by some technical means (e.g. alkali fusion).</p> <p>2) Measurement methods</p> <p>Typical measurement methods are as follows.</p> <p>(1) Inductively Coupled Plasma-Atomic (Optical) Emission Spectroscopy (ICP-AES [ICP-OES]) (e.g. ISO 11885:2007)</p> <p>(2) Atomic Absorption Spectroscopy (AAS) (e.g. EN ISO 5961:1995)</p> <p>(3) Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (e.g. IEC 62321:2008)</p> <p>- If a combination of a sample preparation method and a measurement method can guarantee that the limit of quantification for cadmium is less than 5 ppm, the combination is applicable. Additionally, if it is guaranteed that the limit of quantification for cadmium is less than 5 ppm, IEC 62321:2008 is also applicable.</p> <p>- Both cadmium and lead can be simultaneously analyzed by each of the measurement methods (except for AAS) mentioned above.</p> <p>Note: The extraction methods (including EN71-3:1994, ASTM F 963-96a, ASTM F 963-03, ASTM D 5517, and ISO 8124-3:1997) must not be applied to the sample preparation methods specified in this Standard.</p> <p>When performing measurements based on JIS K 0102, "Testing methods for industrial wastewater," which refers only to measurement methods in section 55, sample preparation methods that are actually applied must be specified along with that JIS standard.</p>

Substances: Lead and lead compounds		
	Targets	Effective date of the ban on the delivery
Level 1	<ul style="list-style-type: none"> <li>- Packaging components and materials (See 4.2.1.)</li> <li>- The paints, and inks containing lead, which are used for PWBs</li> </ul>	Banned since the establishment of this Standard
	<ul style="list-style-type: none"> <li>- Surface coatings (plating) for the external electrodes, lead wires, and other areas of parts (e.g. electrical parts, semiconductor devices, and heat sinks)</li> <li>- The stabilizers, pigments, and dyes contained in the plastic (including rubber) materials that are used for outer and exposed areas of the following articles: mice, devices, AC adaptors, connection cords, remote commanders, and power supply cords</li> <li>- The paints and inks used for outer and exposed areas of devices</li> </ul>	Banned since April 1, 2004

<p>Level 1</p>	<p>All uses except those specified in Level 3 and Exemption                      Typical examples are given below:</p> <ul style="list-style-type: none"> <li>- The surface coatings for the external electrodes, lead wires, etc. of the parts contained in AC adaptors, remote commanders, semiconductor devices, etc.</li> <li>- Leaded solder that meets both of the following conditions: 1) lead content is less than 85 wt%; and 2) lead content is more than 1000 ppm</li> <li>- All kinds of alloys (including solder materials) whose individual lead concentrations exceed their allowable ones provided in the table at the bottom of Exemption below. (*1)</li> <li>- The stabilizers, pigments, and dyes contained in the plastic (including rubber) materials that are used for areas (excluding outer and exposed ones) of the following articles: mice, devices, AC adaptors, connection cords, remote commanders, and power supply cords</li> <li>- The paints and inks used for areas other than the outer and exposed ones of devices</li> </ul>	<p>Banned since January 1, 2005</p>										
	<ul style="list-style-type: none"> <li>- Electroless plating films such as electroless nickel plating and electroless gold plating whose lead content is more than 1000 ppm</li> </ul>	<p>Banned since February 1, 2006</p>										
<p>Level 3</p>	<ul style="list-style-type: none"> <li>- Electroless plating films such as electroless nickel plating and electroless gold plating whose lead content is 1000 ppm or less</li> </ul>	<p>N/A</p>										
<p>Exemption</p>	<ul style="list-style-type: none"> <li>- High melting temperature type solder (i.e. lead based alloys containing 85 wt% or more)</li> <li>- Electronic ceramic parts (e.g. piezoelectric devices, dielectric ones, and magnetic ones [ferrites])</li> <li>- Optical glass, filter glass</li> <li>- Glass of cathode ray tubes, glass of electronic components, and glass of fluorescent tubes</li> </ul> <p>The above glass materials include adhesives, resistor elements, glass frit, conductive pastes (silver or copper ones), and sealing materials.</p> <ul style="list-style-type: none"> <li>- Solder 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 wt% and less than 85 wt%</li> <li>- Solder to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages</li> </ul> <p style="text-align: center;"><b>(*1) Allowable lead concentrations</b></p> <table border="1" data-bbox="357 1458 1169 1711"> <thead> <tr> <th>Type of alloy</th> <th>Allowable lead concentration</th> </tr> </thead> <tbody> <tr> <td>Steel</td> <td>up to 0.35 wt%</td> </tr> <tr> <td>Aluminum alloy</td> <td>up to 0.4 wt%</td> </tr> <tr> <td>Copper alloys (including brass and phosphor bronze)</td> <td>up to 4 wt%</td> </tr> <tr> <td>Solder (*2)</td> <td>up to 1000 ppm</td> </tr> </tbody> </table> <p>(*2) Allowable concentration of lead contained in conductive materials of solder for anisotropic conductive film (ACF) and anisotropic conductive paste (ACP) should be less than 1000 ppm.</p>	Type of alloy	Allowable lead concentration	Steel	up to 0.35 wt%	Aluminum alloy	up to 0.4 wt%	Copper alloys (including brass and phosphor bronze)	up to 4 wt%	Solder (*2)	up to 1000 ppm	<p>N/A</p>
Type of alloy	Allowable lead concentration											
Steel	up to 0.35 wt%											
Aluminum alloy	up to 0.4 wt%											
Copper alloys (including brass and phosphor bronze)	up to 4 wt%											
Solder (*2)	up to 1000 ppm											

<p>Test objects: plastics (including rubber), paints, and inks</p> <p>Allowable concentration: Less than 100 ppm</p>
<p>Standards for measurement</p> <p>1) Sample preparation</p> <p>Typical sample preparation methods are as follows.</p> <p>(1) Incineration under the existence of sulfuric acid (e.g. IEC 62321:2008)</p> <p>(2) A pressurized acid decomposition method done in a sealed container (a microwave decomposition method) (e.g. EPA 3052:1996, EN 13346:2000)</p> <p>(3) An acid decomposition method under the existence of nitric acid, hydrogen-peroxide water, and hydrochloric acid (e.g. EPA 3050B Rev.2:1996)</p> <p>(4) A wet decomposition method under the existence of nitric acid and hydrogen-peroxide water</p> <p>Note: In the process of sample preparation, precipitates must be completely dissolved by some technical means (e.g. alkali fusion).</p> <p>2) Measurement methods</p> <p>Typical measurement methods are as follows.</p> <p>(1) Inductively Coupled Plasma-Atomic (Optical) Emission Spectroscopy (ICP-AES [ICP-OES]) (e.g. ISO 11885:2007)</p> <p>(2) Atomic Absorption Spectroscopy (AAS) (e.g. EN ISO 5961:1995)</p> <p>(3) Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (e.g. IEC 62321:2008)</p> <p>- If a combination of a sample preparation method and a measurement method can guarantee that the limit of quantification for lead is less than 30 ppm, the combination is applicable. Additionally, if it is guaranteed that the limit of quantification for lead is less than 30 ppm, IEC 62321:2008 is also applicable.</p> <p>- Both cadmium and lead can be simultaneously analyzed by each of the measurement methods (except for AAS) mentioned above.</p> <p>Note: The extraction methods (including EN71-3:1994, ASTM F 963-96a, ASTM F 963-03, ASTM D 5517, and ISO 8124-3:1997) must not be applied to the sample preparation methods specified in this Standard.</p> <p>EN 1122:2001 is not applicable to the sample preparation methods for lead.</p> <p>When performing measurements based on JIS K 0102, "Testing methods for industrial wastewater," which refers only to measurement methods in section 54, sample preparation methods that are actually applied must be specified along with that JIS standard.</p>

Substances: Mercury and mercury compounds		
Targets		Effective date of the ban on the delivery
Level 1	- Packaging components and materials (See 4.2.1.) - Paints, and inks - Hour meters - The relays, switches, or sensors whose contacts contain mercury - Mercury or its compounds mixed in plastics	Banned since the establishment of this Standard
	- All uses except those specified in Exemption	Banned since January 1, 2005
Exemption	- Lamps other than small-sized fluorescent ones (e.g. LCD backlights) and straight-tube fluorescent ones (e.g. high-pressure mercury lamps) - Small-sized fluorescent lamps whose mercury content (per lamp) is less than 5 mg - Straight-tube fluorescent lamps whose mercury content (per lamp) is less than 5 mg	N/A

Substances: Hexavalent chromium compounds		
Targets		Effective date of the ban on the delivery
Level 1	- Packaging components and materials (See 4.2.1.)	Banned since the establishment of this Standard
	- Constituents of parts or materials (e.g. inks, paints, additives, etc.) - Residues in the surfaces of screws, steel sheets, etc. that are processed with plating or conversion coating	Banned since January 1, 2005

Substances: Polychlorinated biphenyls (PCB), polychlorinated naphthalenes (PCN), polychlorinated terphenyls (PCT)		
Targets		Effective date of the ban on the delivery
Level 1	- All uses (e.g. capacitors, lubricants, insulating oils, transformers containing oil, paints, and flame retardants in plastics)	Banned since the establishment of this Standard

Substances: Short-chain chlorinated paraffins (SCCP)		
Short-chain chlorinated paraffins with carbon chain length;10-13		
Targets		Effective date of the ban on the delivery
Level 1	- The cabinets of products (including accessories) and PWBs	Banned since the establishment of this Standard
	- All uses other than the above	Banned since February 1, 2006

Substances: Other chlorinated organic compounds		
Targets		Effective date of the ban on the delivery
Level 3	- The plasticizers or flame retardants contained in plastics, and the flame retardants used for PWBs	N/A

Substances: Polybrominated biphenyls (PBB)		
Targets		Effective date of the ban on the delivery
Level 1	- All uses (e.g. flame retardants contained in plastics)	Banned since the establishment of this Standard

Substances: Polybrominated diphenylethers (PBDE) (including decabromodiphenyl ether [DecaBDE])		
Targets		Effective date of the ban on the delivery
Level 1	- All uses (e.g. flame retardants contained in plastics)	Banned since the establishment of this Standard
	- The parts manufactured using the molding dies, which were made in or before December 2002 (Applicable only to the bodies of the displays and TV sets shipped to countries and regions other than European ones) The parts whose molding dies have been made since January 2003 must not contain PBDE.	Banned since January 1, 2005

Substances: Other brominated organic compounds		
Targets		Effective date of the ban on the delivery
Level 3	- The flame retardants contained in plastics, or used for PWBs	N/A

Substances: Tributyltin compounds (TBT) and triphenyltin compounds (TPT)		
Targets		Effective date of the ban on the delivery
Level 1	- All uses (e.g. paints, inks, preservatives, and fungicides)	Banned since the establishment of this Standard

Substances: Asbestos		
Targets		Effective date of the ban on the delivery
Level 1	- All uses (e.g. insulators and fillers)	Banned since the establishment of this Standard

Substances: Specific azo compounds		
Azodyes that form any of the amine compounds listed in Table 4.2a through the decomposition methods cited in the EU Directive 76/769/EEC and amine compounds in Table 4.2a		
Targets		Effective date of the ban on the delivery
Level 1	The substances which are used in parts or articles that may come into direct and prolonged contact with the human skin (e.g. belts, straps, ear phones, head phones, and shoulder pads for bags)	Banned since the establishment of this Standard
Level 3	The parts or articles that do not come into continuous contact with the human skin (e.g. cushions, mice, remote commanders, and carrying bags)	N/A
Test methods (for reference) The methods for decomposing azo compounds and then extracting amines are as follows. 1) EN 14362-1:2003 2) CEN ISO/TS 17234:2003 3) EN 14362-2:2003		

**Table 4.2a List of specific amine compounds**

CAS No.	Amine compounds
92-67-1	4-aminodiphenyl
92-87-5	benzidine
95-69-2	4-chloro-o-toluidine
91-59-8	2-naphthylamine
97-56-3	o-aminoazotoluene
99-55-8	2-amino-4-nitrotoluene
106-47-8	p-chloroaniline
615-05-4	2,4-diaminoanisole
101-77-9	4,4'-diaminodiphenylmethane
91-94-1	3,3'-dichlorobenzidine
119-90-4	3,3'-dimethoxybenzidine
119-93-7	3,3'-dimethylbenzidine
838-88-0	3,3'-dimethyl-4,4'-diaminodiphenylmethane
120-71-8	p-cresidine
101-14-4	4,4'-methylene-bis-(2-chloroanilene)
101-80-4	4,4'-oxideaniline
139-65-1	4,4'-thiodianiline
95-53-4	o-toluidine
95-80-7	2,4-toluylenediamine
137-17-7	2,4,5-trimethylaniline
90-04-0	o-anisidine
60-09-3	4-aminoazobenzene

Substance: Formaldehyde		
Targets		Effective date of the ban on the delivery
Level 1	- The wooden products made from fiberboard, particleboard, or plywood, which are employed in products for import into Europe (e.g. speakers and racks)	Banned since the establishment of this Standard
	- The wooden products made from fiberboard, particleboard, or plywood, which are employed in products for destinations other than Europe (e.g. speakers and racks)	Banned since January 1, 2005
<p>Reference value (emission content): Obtain the value by any one of the following methods.</p> <p>1) [With a chamber method] Concentration in the air: Equal to or less than 0.1 ppm (or 0.124 mg/m<sup>3</sup>) in an air-tight test chamber whose volume is 12 m<sup>3</sup>, 1 m<sup>3</sup>, or 0.0225 m<sup>3</sup></p> <p>2) [With a perforator method] - Equal to or less than 6.5 mg in 100 g of a particleboard without a surface treatment (the average value during six months) - Equal to or less than 7.0 mg in 100 g of a fiberboard without a surface treatment (the average value during six months) - Equal to or less than 8.0 mg in 100 g of a particleboard/fiberboard without a surface treatment (the value derived from the one-time measurement based on EN120)</p> <p>3) [With a desiccator method] - Average content: 0.5 mg/l or less - Maximum content: 0.7 mg/l or less (Use N=2 to check the average and maximum values.)</p>		
<p>Measurement methods:</p> <ul style="list-style-type: none"> <li>- A chamber method specified in EN 717-1:2004</li> <li>- A perforator method specified in EN 120:1992</li> <li>- A desiccator method specified in JIS A 5905 (Fiberboards) and JIS A 5908 (Particleboards)</li> </ul>		

Substances: Polyvinyl chloride (PVC) and PVC blends		
Targets		Effective date of the ban on the delivery
Level 1	- Substrates for FeliCa contactless IC cards * For reference, the targets have never contained PVC or PVC blends.	Banned since before the establishment of this Standard
	- Coating agents and fabrics for the carrying bags, carrying cases, and carrying pouches, which are designed for use with personal computers, digital cameras, camcorders, and portable audio products (excluding those for professional use)	Banned since the establishment of this Standard
	- Cable ties used for accessories and connecting cords	Banned since July 1, 2002
	- Packaging components and materials to protect, contain, or transport products or supplied accessories (e.g. bags, adhesive tapes, cartons, and blister packs)	Banned since January 1, 2005
	- Heat shrink tubes	Banned since April 1, 2005
	- Flexible flat cables (FFC) - Sheets and laminates used for exterior of wooden speakers - Insulating plates, decorative panels, labels, sheets, and laminates	Banned since April 1, 2007

Substances: Polyvinyl chloride (PVC) and PVC blends		
	Targets	Effective date of the ban on the delivery
Level 3	<ul style="list-style-type: none"> <li>- Connection cords for wearable equipment (e.g. cables for ear phones, head phones, and ear microphones)</li> <li>- Coating for insulation and protection used for the inside or outside of devices, insulating tubes, carrying belts, spacers, holders, covers, ducts, etc.</li> <li>- Power supply cords (including ones with some or all of the following: plugs, connectors, or cord bushes) designed for use in Japan, the U.S., and Canada (2P and 3P)</li> <li>- Parts consisting of wires (e.g. connectors with cords) and wires used for internal wiring (e.g. motor leads)</li> <li>- Connection cords (e.g. connection cords for USB or i.LINK, and video cords, AC adaptors secondary leads, flat wires, multi core cables, speaker cords, etc.)</li> <li>- Harnesses and processing wires (e.g. coaxial cables, flat wires, double insulation wires, and shielded wires)</li> <li>- Coating agents and fabrics for the carrying bags, carrying cases, and carrying pouches, which are designed for exclusive use with professional-electronics products</li> <li>- Developing papers</li> <li>- Insulation caps for capacitors, power supply switches, and fuses</li> <li>- Trays, magazine sticks, reels, embossed carrier tapes used by parts suppliers for parts packaging</li> <li>- Suction cups for mounting in-vehicle products</li> <li>- Wiring clip used for the inside of devices (made of polyvinyl chloride-coated metal)</li> </ul> <p>Other parts except those classified into Levels 1 and Exemption</p>	N/A
Exemption	<ul style="list-style-type: none"> <li>- Binder for resins</li> <li>- Polyvinyl electrical wires for high voltage</li> <li>- Insulating tapes</li> <li>- Speaker grilles</li> <li>- Power supply cords designed for use in countries and regions other than Japan, the U.S., and Canada</li> <li>- Parts that are not classified into Levels 1 and 3, and are composed of vinyl chloride copolymers or blends of PVC and other polymers</li> <li>- Transformer leads whose joint is fixed by varnish impregnation</li> <li>- Curl cords</li> <li>- Extra fine electrical wires that are AWG (American Wire Gauge) 36 or more</li> <li>- Professional cables for which general-purpose ones cannot be substituted (e.g. cables for broadcast cameras and microphone cables)</li> </ul>	N/A

Substances: Beryllium oxide		
Targets		Effective date of the ban on the delivery
Level 1	- All uses except those specified in Level 3	April 1, 2008
Level 3	- Specific uses which have no alternative materials	

Substances: Beryllium copper		
Targets		Effective date of the ban on the delivery
Level 3	- All uses	N/A

Substances: Specific phthalates (DEHP, DBP, BBP, DINP, DIDP, DNOP, DNHP)		
Specific phthalates in Table 4.2b		
Targets		Effective date of the ban on the delivery
Level 3	- Plasticizer in polyvinyl chloride resin used for cable coating, cord coating, plugs and connectors	N/A

**Table 4.2b List of specific phthalates (phthalic esters)**

Abbreviation	CAS No.	Name
DEHP	117-81-7	Di (2-ethylhexyl) phthalate
DBP	84-74-2	Di-n-butyl phthalate
BBP	85-68-7	Butyl benzyl phthalate
DINP	28553-12-0 68515-48-0	Diisononyl phthalate (technical mixture)
DIDP	26761-40-0 68515-49-1	Diisodecyl phthalate (technical mixture)
DNOP	117-84-0	Di-n-octyl phthalate
DNHP	84-75-3	Di-n-hexyl phthalate

Substances: Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)		
Targets		Effective date of the ban on the delivery
Level 1	- All uses for refrigerant, insulation and other products	Banned since April 1, 2008

Substances: Perfluorooctane sulfonates (PFOS)		
Targets		Effective date of the ban on the delivery
Level 1	<ul style="list-style-type: none"> <li>- Materials whose PFOS concentration is 0.1 wt% or more</li> <li>- Textiles or other coated materials whose amount of PFOS is 1 µg/m<sup>2</sup> or more of the coated material</li> </ul> Typical examples are given below: <ul style="list-style-type: none"> <li>- Electroplating, paint, colorant, dye, materials coated with water repellent agent, oil repellent agent, antifouling agent (e.g. textile, film, paper, leather), fluoropolymer coating, adhesive, and sealant</li> </ul>	Banned since April 1, 2008
Level 2	All uses except those specified in Level 1 and Exemption	April 1, 2010
Exemption	<ul style="list-style-type: none"> <li>- Photographic coatings applied to films, papers, or printing plates</li> <li>- Photoresists or anti reflective coatings for photolithography processes</li> </ul>	

Substance: Specific benzotriazole		
2-(3',5'-Di-tert-butyl-2'-hydroxyphenyl)benzotriazole (CAS No. 3846-71-7)		
Targets		Effective date of the ban on the delivery
Level 1	Ultraviolet protectants and ultraviolet absorbers applied to decorative laminate, developing papers, molded plastic parts	Banned since April 1, 2008

Substance: Cobalt dichloride		
Targets		Effective date of the ban on the delivery
Level 1	- Moisture indicator used for a desiccant agent (e.g. silica gel)	Banned since April 1, 2009
Level 2	- Humidity indicator card which is impregnated with cobalt dichloride	April 1, 2011

Substance: Ozone depleting substances (ODS)		
ODS in Table 4.2c		
Targets		Effective date of the ban on the delivery
Level 1	- All uses for refrigerant, insulation and other products - Components and materials processed with ODS during cleaning, foaming and other processes	Banned since before the establishment of this Standard

**Table 4.2c List of ozone depleting substances (ODS)**

CAS No.	Name
75-69-4	CFC-11
75-71-8	CFC-12
76-13-1	CFC-113
76-14-2	CFC-114
76-15-3	CFC-115
353-59-3	Halon-1211
75-63-8	Halon-1301
124-73-2	Halon-2402
75-72-9	CFC-13
354-56-3	CFC-111
76-12-0	CFC-112
422-78-6	CFC-211
3182-26-1	CFC-212
165-97-7	CFC-213
29255-31-0	CFC-214
4259-43-2	CFC-215
661-97-2	CFC-216
422-86-6	CFC-217
56-23-5	Carbon tetrachloride
71-55-6	1,1,1-Trichloroethane

**4.2 Additional rules for packaging components and materials**

**4.2.1 Definition of “packaging components and materials”**

Packaging components and materials are defined as products made from any materials and components of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods from the producer to the user or consumer.

Note: The definition excludes the components and materials for the returnable boxes, which are reused or recycled under the control of carriers or parts suppliers, and are not disposed of by end-users or Sony.

**Table 4.3 Additional rules for packaging components and materials**

Substances: Heavy metals (cadmium, lead, mercury, and hexavalent chromium)		
Articles that satisfy not only the rules specified in Table 4.2, but also the following conditions determined by the regulations of relevant laws		
Targets		Effective date of the ban on the delivery
Level 1	- All packaging components and materials Some examples are given in PACKAGING of Table 4.3a.	Banned since the establishment of this Standard
Exemption	- Cartons for returnable boxes owned by carriers or parts suppliers	N/A
<p>Allowable concentrations</p> <p>- “Less than 100 ppm” is determined as the allowable total-concentration of four heavy metals (cadmium, lead, mercury, and hexavalent chromium) contained in each part, ink, or paint that constitutes a package. Regarding allowable concentrations of cadmium and lead contained in plastics (including rubber), paints, and inks, however, regulations for “Cadmium and cadmium compounds” and “Lead and lead compounds” must also be satisfied. (Typical plastic parts: handles, cushions, films, reels, adhesive tapes, magazine sticks [including stoppers], polyvinyl bags, bands, and trays)</p>		
<p>For hexavalent chromium:</p> <ol style="list-style-type: none"> <li>1) First analyze total chromium content and verify that the total concentration of cadmium, lead, mercury and total chromium is less than 100 ppm. When analyzing, the same sample preparation methods as those used for cadmium and lead are applicable.</li> <li>2) If this total concentration is more than 100 ppm, verify that the sum of the cadmium, lead and mercury concentration is less than the 100 ppm limit. When the sum of the cadmium, lead and mercury concentration is less than the 100 ppm limit, analyze and confirm that no hexavalent chromium is present, using the standard methods for detecting hexavalent chromium provided in Table 4.3.</li> </ol>		
<p>Standards for four heavy metals measurement</p> <ol style="list-style-type: none"> <li>1) Sample preparation For cadmium and lead, follow the methods respectively specified in Table 4.2 (3) (4). For total chromium, follow the methods specified in Table 4.2 (3). For mercury, typical test methods are as follows.                     <ol style="list-style-type: none"> <li>(1) A pressurized acid decomposition method done in a sealed container (a microwave decomposition method) (e.g. EPA 3052:1996 or IEC 62321:2008)</li> <li>(2) A heating evaporation-cold-vapor mercury-atomic-absorption method (Full-automatic test equipment is marketed.) (e.g. IEC 62321:2008)</li> <li>(3) A wet decomposition method (e.g. Kjeldahl method) in which a decomposition flask with a reflux condenser is used to decompose mercury by sulfuric acid or nitric acid</li> </ol> <p>Note: In the process of sample preparation, particular attention is required to avoid mercury sublimation, and precipitates must be completely dissolved by some technical means.</p> </li> <li>2) Measurement methods Regarding the measurement of cadmium; lead; and total-chromium concentrations, follow the methods specified in Table 4.2 (3) (4). Regarding the measurement of mercury concentrations, follow the same methods as cadmium and lead specified in Table 4.2 (3) (4). When the mercury concentration is predicted to be low, you are advised to use one of the following methods.                     <ol style="list-style-type: none"> <li>(1) A reduction-evaporation atom-absorption method</li> <li>(2) ICP-AES (ICP-OES) method with a hydride-generation apparatus</li> <li>(3) ICP-MS method with a hydride-generation apparatus</li> </ol> </li> </ol>		

Standard methods for detecting hexavalent chromium:  
 Note: Standard methods specified hereafter are applicable when total concentration of the four elements of cadmium, lead, mercury, and total chromium in packaging components and materials is 100 ppm or more.

Detection methods:

- 1) Sample preparation
  - Extraction methods such as boiling water extraction and alkaline extraction (e.g. EPA 3060A; IEC 62321:2008 Annex C)
- 2) Measurement method
  - Ultraviolet-Visible (UV/VIS) Spectroscopy (e.g. EPA 7196A, IEC 62321:2008 Annex C)

- If a combination of a sample preparation method and a measurement method can guarantee the following limits of quantification, the combination is also available.

- (1) Less than 5 ppm for mercury
- (2) Less than 5 ppm for cadmium
- (3) Less than 5 ppm for the total chromium
- (4) Less than 30 ppm for lead

- Cadmium, lead, and total chromium can be simultaneously analyzed by each of the measurement methods (except for AAS).

- (3) Refer to “Test objects: plastics (including rubber), paints, and inks,” “Substances: Cadmium and cadmium compounds,” in Table 4.2 “Main “Targets” and “Effective date of the ban on the delivery” regarding ‘Controlled Substances.’”
- (4) Refer to “Test objects: plastics (including rubber), paints, and inks,” “Substances: Lead and lead compounds,” in Table 4.2 “Main “Targets” and “Effective date of the ban on the delivery” regarding ‘Controlled Substances.’”

**Table 4.3a Illustrative examples of PACKAGING components/materials and NOT PACKAGING components/materials**

Note: The following lists provide some examples of the products, which we categorize as “packaging” as well as “not packaging,” to serve as a reference. They are not intended to include all products in both categories.

For consumer- and professional-electronics products (used for transporting Sony electronics products)		
PACKAGING		
1.	Carton	Including master carton and sub-master carton made from any materials.
2.	Cushion	
3.	Protection bag, protection sheet	Such as made from foamed plastic or nonwoven fabric
4.	Plastic bag	
5.	Envelope	Such as used for warranty card
6.	Blister pack	
7.	Film	Including protection films such as used for the LCD displays
8.	Clamshell	
9.	Separator, spacer, partition	
10.	Printing ink	Used for packaging components
11.	Adhesive tape	Such as used for closing carton or poly bag, or, fixing or protection for removable component
12.	Staple	
13.	Label	Attached to the packaging components under control of Sony, such as bar-code label
14.	Joint	Carton joint
15.	Band	Such as PP band
16.	Hanging tab	
17.	Carrying handle	Including its related components
18.	Crate	Such as wooden frame
19.	Shrink film	
20.	Bottle	
21.	Sleeve	
22.	Jewel box	Such as packaging for fountain pen
23.	Skid	

NOT PACKAGING		
1.	CD case, CD bag	Cases or bags such as used for video tape, MD, MO, DVD and spindle case which are defined as part of product
2.	Inlay card, inlay label	Such as index-card or label for CD and other recording media which are defined as part of product
3.	Carrying case, carrying pouch	Such as used for headphones, camera, and walkman®, which are defined as part of product
4.	Label	Labels attached to products and others except those attached to packaging components and materials
5.	Label	Labels attached by third parties such as cargo label and/or invoice

For devices, semiconductors, and any other components		
PACKAGING		
1.	Magazine stick	Such as used for IC
2.	Stopper	
3.	Tray	
4.	Reel	

For physical distribution		
PACKAGING		
1.	Pallet	Made from wood, plastic, paper, etc. which is used in one-way transportation, including slip sheet.
2.	Crate	Such as wooden container
3.	Stretch film	Wrap around palletized unit
4.	Wooden container	
5.	Items used for over packaging	Such as carton, cushion, adhesive tape, etc. which is used for component delivery
6.	Band, string	Such as PP band
NOT PACKAGING		
1.	Shipping container, air container	Such as 40 ft container for boat, and air cargo container

**4.3 Rules for batteries (Applicable to all batteries in commercial distribution)**

**4.3.1 Definitions of “Battery,” “Battery pack,” and “Button cell” in this Technical Standard**

“Battery” means any source of electrical energy generated by direct conversion of chemical energy and consisting of one or more primary battery cells (non-rechargeable) or consisting of one or more secondary battery cells (rechargeable).

“Battery Pack” means any set of batteries that are connected together and/or encapsulated within an outer casing so as to form a complete unit that the end-user is not intended to split up or open.

“Button Cell” means any small round portable battery whose diameter is greater than its height and which is used for special purposes such as hearing aids, watches, small portable equipment and back-up power.

Battery cells used for “Battery packs” shall be compliant with the rules specified in Table 4.4, because they are identified as “Battery.”

For “Batteries” and “Battery packs” follow the standards specified in Section 4.1 and 4.2 also.

**Table 4.4 Rules for batteries**

Substances: Heavy metals (cadmium, lead, and mercury)			
Targets			Effective date of the ban on the delivery
Level 1	Cd	- NiCd batteries	Banned since January 1, 2007
		- “Batteries” whose cadmium content, in proportion to the total weight of each one, is 20 ppm or more - “Battery packs” whose cadmium content, in proportion to the total weight of each one, is 20 ppm or more	Banned since January 1, 2008
	Pb	- “Batteries” whose lead content, in proportion to the total weight of each one, is 0.4% or more - “Battery packs” whose lead content, in proportion to the total weight of each one, is 0.4% or more	Banned since January 1, 2005
		- Zinc carbon batteries and alkaline batteries whose lead content, in proportion to the total weight of each one, is 0.2% or more	Banned since April 1, 2008 (*5)
	Hg	- Button cell batteries whose mercury content, in proportion to the total weight of each one, is 2% or more - The following batteries and battery packs except button cell batteries “Batteries” whose mercury content, in proportion to the total weight of each one, is 0.0005% or more “Battery packs” whose mercury content, in proportion to the total weight of each one, is 0.0005% or more	Banned since the establishment of this Standard
		- Zinc carbon batteries and alkaline batteries whose mercury content, in proportion to the total weight of each one, is 0.0001% or more	Banned since April 1, 2008 (*6)

(\*5) The use of those batteries in Argentina has banned since January 29, 2007 in accordance with Argentina regulations on batteries.

(\*6) The use of those batteries in China has banned since January 1, 2005 in accordance with the Chinese regulation “1997 Regulation on Mercury Content Limitation for Batteries.”

## APPENDIXES

### 1. MAJOR CONTROLLED SUBSTANCES, AND EXAMPLES OF APPLICABLE LAWS AND REGULATIONS

### 2. DETAILS OF MAJOR CONTROLLED SUBSTANCES (TYPICAL EXAMPLES)

- Cadmium and cadmium compounds
- Lead and lead compounds
- Mercury and mercury compounds
- Hexavalent chromium compounds
- Polychlorinated biphenyls (PCB), polychlorinated naphthalenes (PCN), polychlorinated terphenyls (PCT)
- Short-chain chlorinated paraffins (SCCP)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenylethers (PBDE)
- Tributyltin compounds (TBT) and triphenyltin compounds (TPT)
- Asbestos
- Formaldehyde
- Polyvinyl chloride (PVC) and PVC blends
- Beryllium oxide
- Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)
- Perfluorooctane sulfonates (PFOS)
- Specific benzotriazole
- Cobalt dichloride

Disclaimer: Applicable laws and regulations, and controlled substances in Appendixes 1 and 2 are illustrative only, not all the substances and its alias name are listed.

## 1. MAJOR CONTROLLED SUBSTANCES, AND EXAMPLES OF APPLICABLE LAWS AND REGULATIONS

Note: This information is confirmed as of March 2009. The laws and regulations cited herein are subject to change, and it is essential to consult the latest editions of the relevant laws and regulations.

Substances	Laws and regulations
Cadmium and cadmium compounds	European Union. EU Directive 76/769/EEC and its amendments.
	European Union. EU Directive 91/338/EEC and its amendments.
	European Union. RoHS Directive 2002/95/EC and its amendments.
	European Union. Batteries Directive 2006/66/EC.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
Lead and lead compounds	European Union. RoHS Directive 2002/95/EC and its amendments.
	European Union. Batteries Directive 2006/66/EC.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
	Denmark: Statutory Order No. 1012 and its amendments.
	Argentina. The Law No.26.184 Portable Power and Resolution 14/2007.
Mercury and mercury compounds	European Union. RoHS Directive 2002/95/EC and its amendments.
	European Union. Batteries Directive 2006/66/EC.
	China. 1997 Regulation on Mercury Content Limitation for Batteries.
	China. Inspection and Management Methods for the Import and Export of Battery Products Containing Mercury. (English translation by EIA)
Hexavalent chromium compounds	European Union. RoHS Directive 2002/95/EC and its amendments.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
Polychlorinated biphenyls (PCB) Polychlorinated naphthalenes (PCN) Polychlorinated terphenyls (PCT)	European Union. EU Directive 76/769/EEC and its amendments.
	Japan. Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, Class I.
Short-chain chlorinated paraffins (SCCP)	Norway. Regulations relating to restrictions on the use, etc. of certain dangerous chemicals.
Polybrominated biphenyls (PBB)	European Union. EU Directive 76/769/EEC and its amendments.
	European Union. RoHS Directive 2002/95/EC and its amendments.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
Polybrominated diphenylethers (PBDE)	European Union. EU Directive 76/769/EEC and its amendments.
	European Union. RoHS Directive 2002/95/EC and its amendments.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
Tributyltin compounds (TBT) Triphenyltin compounds (TPT)	Japan. Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, Class I and Class II.
Asbestos	Japan. Industrial Safety and Health Law.
	Germany. Chemicals Prohibition Ordinance. (German abbreviation: ChemVerbotsV)
Specific azo compounds	European Union. EU Directive 76/769/EEC and its amendments.
Formaldehyde	Germany. Chemicals Prohibition Ordinance. (German abbreviation: ChemVerbotsV)
	Denmark: Statutory Order No. 289.

Substances	Laws and regulations
Heavy metals (lead, cadmium, mercury, and hexavalent chromium)	European Union. EU Directive 94/62/EC on packaging and packaging waste and its amendments.
	New York State and other 15 states in the United States. Regulations on Heavy Metals in Packaging Materials.
Beryllium oxide	European Union. WEEE Directive 2002/96/EC and EU Directive 1999/45/EC.
Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)	European Union. REGULATION 2006/842/EC.
	Denmark: Statutory Order No. 552.
	Switzerland. Ordinance on Risk Reduction related to Chemical Products (ORRChem).
Perfluorooctane sulfonates (PFOS)	European Union. EU Directive 76/769/EEC and its amendments.
Specific benzotriazole	Japan. Law Concerning the Examination and Regulation of Manufacture of Chemical Substances, Class I.
Cobalt dichloride	European Union. EU Directive 76/769/EEC and its amendments.
Ozone depleting substances (ODS)	European Union. EU regulation (EC) No.2037/2000 and its amendments.
	Japan. Law Concerning the Protection of the Ozone Layer through the Control of Specified Substances and Other Measures.
	United States. Clean Air Act Amendments of 1990.
	Republic of Indonesia. Regulation of the Minister of Industry of the Republic of Indonesia No. 33/M-IND/PER/4/2007 dated April 17, 2007.

## 2. DETAILS OF MAJOR CONTROLLED SUBSTANCES (TYPICAL EXAMPLES)

### • Cadmium and cadmium compounds

#### 1. Examples

Name	CAS No.	Chemical formula	Applications
Cadmium	7440-43-9	Cd	Connection materials, surface treatment NiCd batteries
Cadmium alloys			Low melting point solder, fuses, etc.
Cadmium oxide	1306-19-0	CdO	Pigments, alkaline batteries, and materials for chemical synthesis
Cadmium chloride	10108-64-2	CdCl <sub>2</sub>	Plating bath, polyvinyl chloride stabilizers
Cadmium sulfide	1306-23-6; 8048-07-5	CdS	Pigments, paints, inks, and light receiving elements for semiconductors
Cadmium nitrate	10325-94-7	Cd(NO <sub>3</sub> ) <sub>2</sub>	Coloring agents, batteries, and photographs
Cadmium nitrate tetrahydrate	10022-68-1	Cd(NO <sub>3</sub> ) <sub>2</sub> · 4H <sub>2</sub> O	
Cadmium sulfate	10124-36-4	CdSO <sub>4</sub>	Cadmium standard cells, reagent
Cadmium stearate	2223-93-0	Cd(C <sub>18</sub> H <sub>35</sub> O <sub>2</sub> ) <sub>2</sub>	Polyvinyl chloride stabilizers
Other cadmium compounds			

## • Lead and lead compounds

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Lead; metal	7439-92-1	Pb	
Lead -tin alloy		Pb-Sn	Solder, brazing materials, and electric contact
Lead (II) oxide	1317-36-8	PbO	Pigments, rubber vulcanization accelerators, and solid lubricants
Lead (IV) oxide	1309-60-0	PbO <sub>2</sub>	Lead-acid batteries, rubber curing agents, and materials for pigments
Dilead trioxide	1314-27-8	Pb <sub>2</sub> O <sub>3</sub>	
Lead (II, IV) oxide	1314-41-6	Pb <sub>3</sub> O <sub>4</sub>	Pigments, lead-acid batteries, glass, and paints
Lead azide	13424-46-9	PbN <sub>6</sub>	
Lead (II) fluoride	7783-46-2	PbF <sub>2</sub>	Special optical glass, pigments
Lead (II) chloride	7758-95-4	PbCl <sub>2</sub>	
Lead (IV) chloride	13463-30-4	PbCl <sub>4</sub>	
Lead (II) iodide	10101-63-0	PbI <sub>2</sub>	Bronze, printing, and photographs
Lead (II) sulfide	1314-87-0	PbS	Infrared ray detectors in which semiconductor elements are utilized
Lead (II) cyanide	592-05-2	Pb(CN) <sub>2</sub>	Antirust pigments
Lead tetrafluoro borate	13814-96-5	Pb(BF <sub>4</sub> ) <sub>2</sub>	Plating bath, anticorrosive surface treatment
Lead hexa fluorosilicate	25808-74-6	PbSiF <sub>6</sub>	Plating bath, lead refinement
Lead nitrate	10099-74-8	Pb(NO <sub>3</sub> ) <sub>2</sub>	Optical glass
Lead carbonate	598-63-0	PbCO <sub>3</sub>	
Lead hydroxycarbonate	1344-36-1	(PbCO <sub>3</sub> ) <sub>2</sub> Pb(OH) <sub>2</sub>	Pigments, polyvinyl chloride stabilizers
Lead perchlorate	13637-76-8	Pb(ClO <sub>4</sub> ) <sub>2</sub>	
Lead (II) sulfate	7446-14-2; 15739-80-7	PbSO <sub>4</sub>	Pigments, rubber compounding ingredients, polyvinyl chloride stabilizers, and batteries
Lead oxide sulfate	12202-17-4	Pb <sub>4</sub> SO <sub>7</sub>	Pigments
Lead (II) phosphate	7446-27-7	Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	Stabilizers for plastics
Lead thiocyanate	592-87-0	Pb(SCN) <sub>2</sub>	Stain, matches
Lead (II) acetate, trihydrate	6080-56-4	Pb(CH <sub>3</sub> COO) <sub>2</sub> · 3H <sub>2</sub> O	
Lead (II) acetate	301-04-2	Pb(CH <sub>3</sub> COO) <sub>2</sub>	
Lead (IV) acetate	546-67-8	Pb(CH <sub>3</sub> COO) <sub>4</sub>	

Name	CAS No.	Chemical formula	Applications
Lead oleate	1120-46-3	$\text{Pb}[\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COO}]_2$	Lubricants, curing agents, etc.
Lead stearate	7428-48-0	$\text{Pb}(\text{C}_{17}\text{H}_{35}\text{COO})_2$	Lubricants, polyvinyl chloride stabilizers
Lead (II) metaborate	10214-39-8	$\text{Pb}(\text{BO}_2)_2 \cdot \text{H}_2\text{O}$	Desiccants for paints
Lead metasilicate	11120-22-2; 10099-76-0	$\text{PbSiO}_3$	Ceramics
Lead antimonite	13510-89-9	$\text{Pb}_3(\text{SbO}_4)_2$	Pigments, coloring agents for glass
Lead arsenate (1:1)	7784-40-9	$\text{PbHAsO}_4$	
Lead (II) arsenite	10031-13-7	$\text{Pb}(\text{AsO}_2)_2$	Pesticides
Lead chromate; chrome yellow	1344-37-2	$\text{PbCrO}_4$	Pigments, paints, and inks
Lead molybdate	10190-55-3	$\text{PbMoO}_4$	Pigments
Calcium plumbate	12013-69-3	$\text{Ca}_2\text{PbO}_4$	Oxidizers
Tetramethyl lead	75-74-1	$\text{Pb}(\text{CH}_3)_4$	
Tetraethyl lead	78-00-2	$\text{Pb}(\text{C}_2\text{H}_5)_4$	
Other lead compounds and alloys			

## • Mercury and mercury compounds

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Mercury	7439-97-6	Hg	Electrodes, mercury lamps
Mercury alloys; amalgam			
Mercury (I) oxide	15829-53-5	Hg <sub>2</sub> O	
Mercury (II) oxide	21908-53-2	HgO	Mercury cells, preservatives
Mercury (I) chloride	10112-91-1	Hg <sub>2</sub> Cl <sub>2</sub>	Electrodes, pigments
Mercury (II) chloride	7487-94-7	HgCl <sub>2</sub>	Metal etching, batteries, and preservatives
Mercury (II) nitrate	10045-94-0	Hg(NO <sub>3</sub> ) <sub>2</sub>	Felt, catalysts
Mercury (I) sulfate	7783-36-0	Hg <sub>2</sub> SO <sub>4</sub>	Batteries
Mercury (II) fulminate	628-86-4	Hg(ONC) <sub>2</sub>	
Mercury (II) acetate	1600-27-7	Hg(CH <sub>3</sub> COO) <sub>2</sub>	
Methylmercury salts	e.g. 22967-92-6	CH <sub>3</sub> HgX; X=Cl, Br, I, OH, etc.	Fungicides
Ethylmercury salts		C <sub>2</sub> H <sub>5</sub> HgX; X=Cl, Br, I, OH, etc.	Preservatives, disinfectants
Propylmercury salts		C <sub>3</sub> H <sub>7</sub> HgX; X=Cl, Br, I, OH, etc.	
Phenylmercury salts		C <sub>6</sub> H <sub>5</sub> HgX; X=Cl, Br, I, OH, etc.	Preservatives, disinfectants
Methoxyethylmercury salts		CH <sub>3</sub> OC <sub>2</sub> H <sub>4</sub> HgX; X=Cl, Br, I, OH, etc.	Disinfectants, fungicides
Dialkylmercury		R <sub>2</sub> Hg; R=alkyl group (C <sub>n</sub> H <sub>2n+1</sub> )	
Diphenylmercury	587-85-9	(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> Hg	
Other mercury compounds			

## ● Hexavalent chromium compounds

Note: Only substances containing hexavalent chromium compounds belong to this category.

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Chromium (VI) oxide; Chromium trioxide	1333-82-0	$\text{CrO}_3$	Pigments, catalysts, plating, and tanning
Lithium chromate	14307-35-8	$\text{Li}_2\text{CrO}_4$	Antirust
Sodium chromate	7775-11-3	$\text{Na}_2\text{CrO}_4$	Antirust, tanning
Potassium chromate	7789-00-6	$\text{K}_2\text{CrO}_4$	Pigments, inks, and tanning
Potassium chlorochromate	16037-50-6	$\text{K}[\text{CrO}_3\text{Cl}]$	
Ammonium chromate	7788-98-9	$(\text{NH}_4)_2\text{CrO}_4$	Photographs, catalysts
Copper chromate	13548-42-0	$\text{CuCrO}_4$	Mordants
Magnesium chromate	13423-61-5	$\text{MgCrO}_4$	Antirust, surface treatment
Calcium chromate	13765-19-0	$\text{CaCrO}_4$	Pigments, inks, and tanning
Strontium chromate	7789-06-2	$\text{SrCrO}_4$	Pigments, antirust
Barium chromate	10294-40-3	$\text{BaCrO}_4$	Pigments, antirust, and coloring agents for ceramics
Lead chromate; Chrome yellow	1344-37-2	$\text{PbCrO}_4$	Pigments, paints, and inks
Zinc chromate	12018-19-8; 13530-65-9; 14018-95-2	$\text{ZnCrO}_4$	Pigments, anticorrosives
Sodium dichromate; Sodium bichromate	10588-01-9	$\text{Na}_2\text{Cr}_2\text{O}_7$	Pigments, photographs, tanning, and antirust
Potassium dichromate; Potassium bichromate	7778-50-9	$\text{K}_2\text{Cr}_2\text{O}_7$	Pigments, photographs, batteries, plating, and tanning
Ammonium dichromate; Ammonium bichromate	7789-09-5	$(\text{NH}_4)_2\text{Cr}_2\text{O}_7$	Pigments, photographs, and catalysts
Calcium dichromate; Calcium bichromate	14307-33-6	$\text{CaCr}_2\text{O}_7$	Catalysts, antirust
Zinc dichromate; Zinc bichromate		$\text{ZnCr}_2\text{O}_7$	Pigments
Other hexavalent chromium compounds			

• **Polychlorinated biphenyls (PCB), polychlorinated naphthalenes (PCN), polychlorinated terphenyls (PCT)**

1. Examples

Name	CAS No.	Chemical formula	Applications
PCB; Polychlorinated biphenyls	1336-36-3	$C_{12}H_{10-x}Cl_x$ ( $x = 1 - 10$ )	Lubricants, heating mediums, and oils for capacitors
PCN; Polychlorinated naphthalenes		$C_{10}H_{8-x}Cl_x$ ( $x \geq 3$ )	Lubricants, preservatives, and paints
Trichloronaphthalenes	1321-65-9	$C_{10}H_5Cl_3$	
Tetrachloronaphthalenes	1335-88-2	$C_{10}H_4Cl_4$	
Pentachloronaphthalenes	1321-64-8	$C_{10}H_3Cl_5$	
Octachloronaphthalenes	2234-13-1	$C_{10}Cl_8$	
PCT; Polychlorinated terphenyls	61788-33-8	$C_{18}H_{14-x}Cl_x$ ( $x = 1 - 14$ )	Lubricants, preservatives, and paints

• **Short-chain chlorinated paraffins (SCCP)**

1. Examples

Name	CAS No.	Chemical formula	Applications
Short-chain Chlorinated paraffins C10-13	e.g. 85535-84-8		Plasticizers, flame retardants

• **Polybrominated biphenyls (PBB)**

1. Examples

Name	CAS No.	Chemical formula	Applications
Polybrominated biphenyls; PBB	e.g. 67774-32-7	$C_{12}H_{10-x}Br_x$ ( $x = 1 - 10$ )	Flame retardants

● **Polybrominated diphenylethers (PBDE)**

1. Examples

Name	CAS No.	Chemical formula	Applications
Polybromodiphenyl ether; Polybromodiphenyloxyde; Polybrominated biphenyl ethers; PBDE; PBDO; PBBE		$C_{12}H_{10-x}Br_xO$ ( $x = 1 - 10$ )	Flame retardants
Decabromodiphenyl ether; Decabromodiphenyloxyde; DBDE; DecaBDE; DBDPE; DBDPO	1163-19-5	$C_{12}Br_{10}O$	Flame retardants (for PE, ABS, and polyester)
Octabromodiphenyl ether; Octabromodiphenyloxyde; OBDE; OctaBDE	32536-52-0	$C_{12}H_2Br_8O$	Flame retardants (for ABS, HIPS, and LDPE)
Hexabromodiphenyl ether; Hexabromodiphenyloxyde	36483-60-0	$C_{12}H_4Br_6O$	Flame retardants
Pentabromodiphenyl ether; Pentabromodiphenyloxyde; PentaBDE	32534-81-9	$C_{12}H_5Br_5O$	Flame retardants

• **Tributyltin compounds (TBT) and triphenyltin compounds (TPT)**

Note: Only tributyltin compounds and triphenyltin compounds belong to this category.

Dibutyltin compounds (DBT), diphenyltin compounds (DPT), metal tin, tin alloys, tin plating, and tin inorganic compounds do not fall under this category.

1. Examples

Name	CAS No.	Chemical formula	Applications
Tributyltin bromide	1461-23-0	$(C_4H_9)_3SnBr$	Disinfectants
Tributyltin oxide; Bis (tributyltin) oxide; Distannoxane, hexabutyl-	56-35-9	$C_{24}H_{54}OSn_2$	Disinfectants
Triphenyl tin	668-34-8	$(C_6H_5)_3Sn$	Disinfectants
Triphenyltin chloride; Fentin chloride; Stannane, chlorotriphenyl-	639-58-7	$(C_6H_5)_3SnCl$	Disinfectants
Triphenyltin hydroxide; Fentin hydroxide; Stannane, hydroxytriphenyl-	76-87-9	$(C_6H_5)_3SnOH$	Disinfectants
Triphenyltin N, N' -dimethyldithiocarbamate; Stannane, [[(dimethylamino) thiomethyl] thio] triphenyl-	1803-12-9	$(C_6H_5)_3Sn(CH_3)_2NCS_2$	
Triphenyltin fluorid; Fentin fluoride	379-52-2	$(C_6H_5)_3SnF$	
Triphenyltin acetate; Fentin acetate; Stannane, (acetyloxy) triphenyl-	900-95-8	$(C_6H_5)_3SnOCOCH_3$	
Triphenyltin fatty acid salts Note: The triphenyltin fatty acid salts specified here are limited to those with a 9-, 10-, or 11-carbon chain.	18380-71-7; 18380-72-8; 47672-31-1; 94850-90-5		

Name	CAS No.	Chemical formula	Applications
Triphenyltin chloroacetate; (chloroacetoxo) triphenylstannane	7094-94-2	$(C_6H_5)_3SnOCOCH_2Cl$	
Tributyltin methacrylate; Tributyl (methacryloyloxy) stannane; Stannane, tributyl [(2-methyl-1-oxo-2-propenyl) oxy]-	2155-70-6	$(C_4H_9)_3SnC_4H_5O_2$	
Bis (tributyltin) fumarate	6454-35-9; 24291-45-0	$C_2H_2(COO)_2$ $([C_4H_9]_3Sn)_2$	
Tributyltin fluoride	1983-10-4; 7304-48-5	$(C_4H_9)_3SnF$	
Bis (tributyltin) 2, 3-dibromosuccinate	31732-71-5; 56323-17-2	$([C_4H_9]_3Sn)_2C_2H_2$ $(BR)_2(COO)_2$	
Tributyltin acetate	56-36-0	$(C_4H_9)_3SnOCOCH_3$	
Tributyltin laurate; Tributyl (lauroyloxy) stannane	3090-36-6	$(C_4H_9)_3SnC_{12}H_{23}O_2$	
Bis (tributyltin) phthalate; [(Phthaloylbis (oxy)) bis (tributylstannane)	4782-29-0	$(C_6H_4)(COO)_2$ $([C_4H_9]_3Sn)_2$	
Tributyltin sulfamate; Stannane, [(aminosulfonyl oxy] tributyl-	6517-25-5	$(C_4H_9)_3SnSO_3NH_2$	
Bis (tributyltin) maleate	14275-57-1; 24291-45-0	$C_{28}H_{56}O_4Sn_2$	
Tributyltin chloride; Tributylchlorostannane; Stannane, tributylchloro-	1461-22-9; 7342-38-3	$(C_4H_9)_3SnCl$	

Name	CAS No.	Chemical formula	Applications
Mixture of tributyltin 1,2,3,4,4a,4b,5,6,10,10a-decahydro-7-i sopropyl-1,4a-dimethyl-1-phenanthlene carboxylate and its analogs; Tributyltin rosin salt	85409-17-2		
[1R-(1alpha,4a.beta.,4b.alpha.,10a.alp ha.)]-tributyl [[[1,2,3,4,4a,4b,5,6,10,10a-decahydro- 7-isopropyl-1,4a-dimethyl-1-phenanthry l]carbonyl] oxy] stannane	26239-64-5	$C_{32}H_{56}O_2Sn$	
Octyl acrylate-methyl methacrylate-tributyltin methacrylate copolymer (alkyl; C = 8)	67772-01-4		

## • Asbestos

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Asbestos	1332-21-4; 132207-32-0; 132207-33-1		Insulators, fillers
Crocidolite	12001-28-4	$\text{Na}_2\text{Fe}_5(\text{Si}_8\text{O}_{22})(\text{OH})_2$	Insulators, fillers
Chrysotile	12001-29-5	$\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$	Insulators, fillers
Amosite	12172-73-5	$(\text{Mg}, \text{Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	Insulators, fillers
Anthophyllite	77536-67-5	$(\text{Mg}, \text{Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	Insulators, fillers
Tremolite	77536-68-6	$\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$	Insulators, fillers
Actinolite	77536-66-4	$\text{Ca}_2(\text{Mg}, \text{Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$	Insulators, fillers

## • Formaldehyde

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Formaldehyde; formalin; formic aldehyde; formol	50-00-0	$\text{CH}_2\text{O}$	Preservatives, monomer (e.g. phenol resin and melamine resin)

## • PVC and PVC blends

### 1. Examples

Name	CAS No.	Chemical formula	Applications
PVC and PVC blends; Polyvinyl chloride and polyvinyl chloride blends	e.g. 9002-86-2		Polyvinyl chloride resin

## • Beryllium oxide

### 1. Examples

Name	CAS No.	Chemical formula	Applications
Beryllium oxide	e.g. 1304-56-9	$\text{BeO}$	Heat sink

● **Hydrofluorocarbon (HFC), Perfluorocarbon (PFC)**

1. Examples

Name	CAS No.	Chemical formula	Applications
HFC-23; Trifluoromethane	75-46-7	CHF <sub>3</sub>	Refrigerant
HFC-32; Difluoromethane	75-10-5	CH <sub>2</sub> F <sub>2</sub>	Refrigerant
HFC-41; Fluoromethane	593-53-3	CH <sub>3</sub> F	Refrigerant
HFC-125; Pentafluoroethane	354-33-6	C <sub>2</sub> HF <sub>5</sub>	Refrigerant
HFC-134; 1,1,2,2-tetrafluoroethane	359-35-3	CHF <sub>2</sub> CHF <sub>2</sub>	Refrigerant
HFC-134a; 1,1,1,2-tetrafluoroethane	811-97-2	CH <sub>2</sub> FCF <sub>3</sub>	Refrigerant
HFC-143; 1,1,2-trifluoroethane	430-66-0	CHF <sub>2</sub> CH <sub>2</sub> F	Refrigerant
HFC-143a; 1,1,1-trifluoroethane	420-46-2	CH <sub>3</sub> CF <sub>3</sub>	Refrigerant
HFC-152a; 1,1-difluoroethane	75-37-6	CH <sub>3</sub> CHF <sub>2</sub>	Refrigerant
HFC-227ea; 1,1,1,2,3,3,3-heptafluoropropane	431-89-0	C <sub>3</sub> HF <sub>7</sub>	Extinguishing agent
HFC-236fa; 1,1,1,3,3,3-hexafluoropropane	690-39-1	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	Extinguishing agent
HFC-245ca; 1,1,2,2,3-pentafluoropropane	679-86-7	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	Refrigerant
HFC-43-10mee; 1,1,1,2,3,4,4,5,5,5-decafluoropentane	138495-42-8	C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>	Solvent
PFC-14; Perfluoromethane	75-73-0	CF <sub>4</sub>	Dry etching
PFC-116; Perfluoroethane	76-16-4	C <sub>2</sub> F <sub>6</sub>	Refrigerant
PFC-218; Perfluoropropane	76-19-7	C <sub>3</sub> F <sub>8</sub>	Refrigerant
PFC-31-10; Perfluorobutane	355-25-9	C <sub>4</sub> F <sub>10</sub>	Extinguishing agent
PFC-c318; Perfluorocyclobutane	115-25-3	c-C <sub>4</sub> F <sub>8</sub>	Dry etching
PFC-41-12; Perfluoropentane	678-26-2	C <sub>5</sub> F <sub>12</sub>	Solvent
PFC-51-14; Perfluorohexane	355-42-0	C <sub>6</sub> F <sub>14</sub>	Refrigerant

• **Perfluorooctane sulfonates (PFOS)**

1. Examples

Name	CAS No.	Chemical formula	Applications
PFOS; Perfluorooctane sulfonates	e.g. 2795-39-3	$C_8F_{17}SO_2X$ (X=hydroxyl, metallic salt, halide, amide, and other derivatives, including polymers)	Water repellent agent, oil repellent agent

• **Specific benzotriazole**

1. Examples

Name	CAS No.	Chemical formula	Applications
2-(3',5'-Di-tert-butyl-2'-hydroxyphenyl)benzotriazole; 2-(2'-Hydroxy-3',5'-di-tert-butylphenyl)benzotriazole	3846-71-7	$C_{20}H_{25}N_3O$	Ultraviolet protectants, ultraviolet absorbers

• **Cobalt dichloride**

1. Examples

Name	CAS No.	Chemical formula	Applications
Cobalt dichloride	7646-79-9	$CoCl_2$	Moisture indicator used for a desiccant agent (e.g. silica gel)

(Note)

This document is subject to change without prior notice, as a result of a revision or modifications on the SS-00259, the Sony Technical Standard titled “Management Regulations for the Environment-related Substances to be Controlled which are included in Parts and Materials.”

Management Regulations for the Environment-related Substances to be Controlled which are included in Parts and Materials

SS-00259 for General Use, Eighth Edition

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# 零部件和材料中的环境管理物质 管理规定

(SS-00259 第 8 版 一般公开版)

**SONY**

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## 1. 目的

本技术标准是：通过明确构成索尼电子产品的零部件和组件等中含有的环境管理物质之(1)禁止使用物质、(2)计划全废物质、(3)适用对象外项目，以防止这些物质混入索尼电子产品中，同时实现遵守法令、保护地球环境以及减轻对生态系统的影响等的目的。

## 2. 适用范围

### 2.1 零部件和材料的适用范围

本技术标准适用于：索尼集团以及由索尼集团委托设计、制造的产品所包含的零部件、材料及其他物品。这些对象均必须符合本技术标准的规定。

所适用的零部件和材料等为：

- 半成品(功能单元、模组、板组件(board assemblies)等的组装零部件等)
- 零部件(电气零部件、机械零部件、半导体器件、印刷线路板、记录媒体、包装零部件和材料)
- 螺丝
- 附件(配合机器使用的附属品，例如，遥控指挥器、鼠标、AC适配器等)
- 产品采用的辅助材料(胶带(adhesive tape)、焊接材料、粘结剂等)之组成材料等
- 印刷品(操作说明书、保证书、产品和零部件相关的补充信息 等)
- 修理用零部件(对于已出货产品的修理用部分零部件，应依照另行规定的通知书执行)
- 零部件交货厂商为了发送或保护货物而使用「4.2.1 包装零部件和材料的定义」中所定义的包装零部件和材料
- 电池

### 2.2 产品的适用范围

- (1) 由索尼集团设计和制造、销售、借阅以及发布的索尼电子产品
- (2) 索尼集团委托第三者设计和制造，且贴有索尼集团的商标进行销售、借阅或发布的索尼电子产品
- (3) 第三者委托索尼集团进行设计和制造的电子产品  
(但是，由该第三者指定的零部件和材料除外)

此外，对本技术标准中未明确规定的物质或是其用途，如果各国或当地法令规定禁止使用或限制使用该物质或用途时，则必须遵照相关法令执行。

### 3. 术语的定义

本技术标准中所使用的术语定义如下：

(1) 环境管理物质

包含在零部件和组件等的物质中，由索尼判断对地球环境和人体存在着显著影响的物质。

(2) 管理级别

按照以下3种管理级别和适用对象外的分类进行管理。

(a) 1级

相应对象物质及其用途禁止使用于零部件和材料中。

(b) 2级

表中规定的该日期开始(即：禁止供货时期栏中所指定的日期)指定提升为「1级」。

(c) 3级

目前虽然没有规定全废的目标日期，但是指定了希望并努力完全废除使用的零部件和材料中所含有的物质及其用途。当判断可以导入其代替的零部件、开发新材料和代替技术时，即可由3级提升至2级，同时逐步实现全废的目标。

(d) 适用对象外

不在法令的规定范围内，或者现阶段没有代替技术方案的物质和用途部位。

(3) 含有

含有是指：无论是否有意，在所有产品的零部件和组件或其使用的材料中添加、填充、混入或粘附的物质(包括在加工过程中无意混入或粘附于产品中的物质)。

但是，制造半导体器件等使用的掺杂剂(Dopant)虽然是有意添加，但实质上在半导体器件中其残存量极少时，则不定义为「含有」，而定义为「杂质」。

(4) 杂质

杂质是指：包含在天然材料中，作为工业材料的精制过程中技术上不能完全去除的物质(natural impurity)，或者在合成反应的过程中产生但技术上不能完全去除的物质。

此外，为了与主原料加以区别而称为「杂质」的物质，如果其使用目的是为了改变材料的特性时，则作为「含有」处理。

(注) 本技术标准中指定了相关的允许浓度，如果在零部件和组件中混入或者粘附了作为杂质的相应环境管理物质时，其浓度不能大于本技术标准所规定的允许浓度。

(5) 禁止供货时期

禁止向索尼供应零部件和材料的时期。

(6) 本技术标准中定义的塑料

—由合成高分子物质形成的材料或素材—

包括由合成高分子制成的纤维、薄膜、胶带(adhesive tape)、成型产品、合成橡胶产品、植物原料塑料、粘结剂等。

另外，天然树脂与上述的合成高分子物质合成的材料，也定义为塑料。

#### 4. 环境管理物质的管理标准

##### 4.1 环境管理物质

本技术标准中作为对象的环境管理物质名称如表 4.1 所示

表 4.1 环境管理物质名称一览表

物质名称	
重金属	镉以及镉化合物
	铅以及铅化合物
	汞以及汞化合物
	六价铬化合物
有机氯化物	多氯联苯 (PCB)
	多氯化萘 (PCN)
	多氯三联苯 (PCT)
	短链型氯代烷烃 (SCCP)
	其他有机氯化物
有机溴化合物	多溴联苯 (PBB)
	包含十溴联苯醚 (DecaBDE) 的多溴联苯醚 (PBDE)
	其他有机溴化合物
三丁基锡化合物 (TBT)	
三苯基锡化合物 (TPT)	
石棉	
特定偶氮化合物	
甲醛	
聚氯乙烯 (PVC) 以及聚氯乙烯混合物	
氧化铍	
铍青铜	
特定邻苯二甲酸盐 (DEHP、DBP、BBP、DINP、DIDP、DNOP、DNHP)	
氢氟碳化合物 (HFC)、全氟化碳 (PFC)	
全氟辛烷磺酸 (及其盐) (PFOS)	
特定苯并三氮唑	
二氯化钴	
臭氧层破坏物质 (ODS)	

表 4.2 关于环境管理物质的主要对象和禁止供货时期

物质名称：镉以及镉化合物		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>· 包装零部件和材料(参照 4.2.1 的内容)</li> <li>· 塑料(包括橡胶)材料中含有的稳定剂、颜料、染料(电器配线的绝缘体、遥控指挥器·键、扎线带(cable tie)、电子元器件的外装树脂、外框(机壳)、标签、唱片等)</li> <li>· 涂料、油墨</li> <li>· 表面处理(电镀、无电解电镀等)、涂层</li> <li>· 照片胶卷</li> <li>· 日光灯(小型日光灯、直管日光灯)</li> </ul>	立即执行
	<p>「适用对象外」以外之所有用途。</p> <p>例如，</p> <ul style="list-style-type: none"> <li>· 直流电动机、开关、继电器、断路器等电气接点</li> <li>· 温度保险丝的可熔体</li> <li>· 玻璃以及玻璃涂料的颜料、染料(用于玻璃的颜料、染料以及玻璃用涂料)</li> <li>· 焊料(镉含量大于 20 ppm(Cd &gt; 20 ppm)的焊料)</li> <li>· 荧光显示装置中含有的荧光体、CdS(硫化镉)光敏传感器</li> <li>· 电阻(玻璃料)</li> </ul> <p>等</p>	立即执行 (从 2005 年 1 月 1 日开始)
	<ul style="list-style-type: none"> <li>· 含锌金属(黄铜、熔融镀锌等)构成的零部件及相应部位中的镉含量大于 100 ppm 的零部件及相应部位 (Cd &gt; 100 ppm)</li> </ul>	立即执行 (从 2005 年 10 月 1 日开始)
适用对象外	<ul style="list-style-type: none"> <li>· 要求使用可靠性高的电气接点电镀，但是没有替代材料的电镀</li> <li>· 光学玻璃、滤光玻璃</li> </ul>	

测定对象：塑料(包括橡胶)、涂料、油墨  
含镉允许浓度应小于 5 ppm ( Cd < 5 ppm)

测定标准：

(1) 预处理

有关预处理方法主要有下列 4 种：

1. 存在硫酸状态下进行的灰化法(硫酸灰化法) (例如, IEC62321: 2008)
2. 在密闭容器内进行的加压酸分解法[包括微波分解法(例如, EN 13346: 2000 或 EPA 3052: 1996)]
3. 采用硝酸、过氧化氢溶液、盐酸进行的酸分解法(例如, EPA 3050B Rev. 2: 1996)
4. 采用硫酸、硝酸、过氧化氢溶液进行的湿式分解法(例如, BS EN 1122: 2001)

(注) 如果在上述所有的预处理过程中, 产生沉淀物(不溶解物质)时, 必须采取某种方法(碱溶法等)完全溶解该沉淀物。

(2) 测定法

有关测定方法主要有下列 3 种：

1. 电感耦合等离子体发射光谱法 [ICP-AES (ICP-OES)] ; (例如, ISO 11885: 2007)
2. 原子吸收分光光度法(AAS); (例如, EN ISO 5961: 1995)
3. 电感耦合等离子体质谱法(ICP-MS); (例如, IEC62321: 2008)

除上述方法以外, 将预处理和测定方法结合起来, 如果结果可以保证镉的定量下限值在 5 ppm 以下, 该方法所获得的测定结果合格。另外, 若能保证定量下限值小于 5 ppm, IEC 62321: 2008 处所记述的方法也可以。此外, 镉和铅也可以同时采用上述(2)中的测定法进行分析, 但是, 「2. 原子吸收分光光度法(AAS)」的方法除外。

(注) 在 EN 71-3: 1994、ASTM F963-96a、ASTM F963-03、ASTM D 5517、ISO 8124-3: 1997 中具代表性的萃取法不适合作为预处理的方法。

因 JIS K0102「工业废水的试验法」第 55 项仅记载了测定法, 所以必须同时记述预处理的方法。

物质名称：铅以及铅化合物		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>· 包装零部件和材料(参照 4.2.1 的内容)</li> <li>· 用于印刷线路板中的含铅涂料与油墨</li> </ul>	立即执行
	<ul style="list-style-type: none"> <li>· 零部件的外部电极、引线端子等的表面处理(例如, 电气零部件、半导体器件、散热片等)</li> <li>· AC 适配器、电源线、连接电缆、遥控指挥器、鼠标、机器的外露部位所使用的塑料(包括橡胶)材料中含有的稳定剂、颜料、染料</li> <li>· 用于机器的外露部位的涂料、油墨</li> </ul>	立即执行 (从 2004 年 4 月 1 日开始)

1 级	<p>「3 级」和「适用对象外」以外的所有用途</p> <p>例如，</p> <ul style="list-style-type: none"> <li>· 零部件的外部电极、引线端子等的表面处理，内藏在 AC 适配器、遥控指挥器、半导体器件等中的零部件之外部电极、引线端子等的表面处理。</li> <li>· 对于铅的重量百分比小于 85wt% 的含铅焊锡，其铅的含有量超过 1000 ppm 的焊料 (Pb &gt;1000 ppm)。</li> <li>· 超过以下所允许浓度(*1)的各种合金(包括焊锡材料)。</li> <li>· AC 适配器、电源线、连接电缆、遥控指挥器、鼠标、机器的外露部位以外使用的塑料(包括橡胶)材料中含有的稳定剂、颜料、染料。</li> <li>· 用于机器的外露部位以外的涂料、油墨。</li> </ul> <p>等</p>	立即执行 (从 2005 年 1 月 1 日开始)										
3 级	<ul style="list-style-type: none"> <li>· 在无电解镀镍、无电解镀金等的无电解电镀皮膜中的铅含量小于或等于 1000ppm 的皮膜 (Pb ≤1000 ppm)。</li> </ul>	立即执行 (从 2006 年 2 月 1 日开始)										
适用对象外	<ul style="list-style-type: none"> <li>· 连接零部件和组件用的高熔点焊料(即，铅的重量百分比大于或等于 85wt% 的有铅焊锡)。</li> <li>· 电子陶瓷零部件(例如，压电材料、介质材料、磁性材料[铁素体系])。</li> <li>· 光学玻璃、滤光玻璃。</li> <li>· 用于显像管、电子元器件、荧光管的玻璃材料。</li> </ul> <p>电子元器件上所使用的玻璃材料包括电阻、导电浆(银浆、铜浆)、粘结剂、玻璃料、密封材料(密封胶(sealant))等。</p> <ul style="list-style-type: none"> <li>· 用于焊接微处理器端子和器件封装的焊料中，由 2 种以上的元素组成之含铅量大于 80wt% 但小于 85 wt% 的焊料(80wt% &lt; Pb &lt; 85wt%)。</li> <li>· 连接集成电路板叩焊晶片内部的半导体芯片和连接电路板的焊料(包括 IC 内部焊接用突块(bump)下面使用的焊锡膏)。</li> </ul> <p style="text-align: center;">(*1) 各种合金的含铅允许浓度</p> <table border="1" data-bbox="464 1328 1257 1518"> <thead> <tr> <th>合金的种类</th> <th>含铅允许浓度</th> </tr> </thead> <tbody> <tr> <td>钢材</td> <td>≤ 0.35 wt%</td> </tr> <tr> <td>铝合金</td> <td>≤ 0.4 wt%</td> </tr> <tr> <td>铜合金(也包括铸铜、磷青铜)</td> <td>≤ 4 wt%</td> </tr> <tr> <td>焊料(*2)</td> <td>≤ 1000 ppm</td> </tr> </tbody> </table> <p>各向异性的导电胶片(ACF)及各向异性的导电糊剂(ACP)中如果使用焊料时，该导电物质应采用的焊料为：各种合金的含铅允许浓度中规定的焊料(*2)，即小于或等于 1000 ppm 的焊料。</p>	合金的种类	含铅允许浓度	钢材	≤ 0.35 wt%	铝合金	≤ 0.4 wt%	铜合金(也包括铸铜、磷青铜)	≤ 4 wt%	焊料(*2)	≤ 1000 ppm	
合金的种类	含铅允许浓度											
钢材	≤ 0.35 wt%											
铝合金	≤ 0.4 wt%											
铜合金(也包括铸铜、磷青铜)	≤ 4 wt%											
焊料(*2)	≤ 1000 ppm											

测定对象： 塑料(包括橡胶)、涂料、油墨

含铅允许浓度应小于 100 ppm ( Pb < 100 ppm)

测定标准：

(1) 预处理

有关预处理方法主要有下列 4 种：

1. 存在硫酸状态下进行的灰化法(硫酸灰化法) (例如, IEC 62321 : 2008)
2. 在密闭容器内进行的加压酸分解法 (微波分解法) (例如, EN 13346: 2000 或 EPA 3052: 1996)
3. 采用硝酸、过氧化氢溶液、盐酸进行的酸分解法 (例如, EPA 3050B Rev. 2: 1996)
4. 采用硝酸、过氧化氢溶液进行的湿式分解法

(注) 如果在上述所有的预处理过程中, 产生沉淀物(不溶解物质)时, 必须采取某种方法(碱溶法等)完全溶解该沉淀物。

(2) 测定法

有关测定方法主要有下列 3 种：

1. 电感耦合等离子体发射光谱法 [ ICP-AES( ICP-OES ) ] ; (例如, EN ISO 11885: 2007)
2. 原子吸收分光光度法(AAS); (例如, EN ISO 5961: 1995)
3. 电感耦合等离子体质谱法(ICP-MS); (例如, IEC 62321: 2008)

除上述方法以外, 将预处理和测定方法结合起来, 如果结果可以保证铅的定量下限值在 30 ppm 以下, 该方法所获得的测定结果合格。另外, 若能保证定量下限值小于 30ppm, IEC 62321: 2008 处所记述的方法也可以。此外, 镉和铅也可以同时采用上述(2)中的测定法进行分析, 但是, 「2. 原子吸收分光光度法(AAS)」的方法除外。

(注) 在 EN 71-3: 1994、ASTM F963-96a、ASTM F963-03、ASTM D 5517、ISO 8124-3: 1997 中具代表性的萃取法不适合作为预处理的方法。另外, EN 1122: 2001 也不适合作为铅的预处理法。

因 JIS K0102「工业废水的试验法」第 54 项仅记载了测定法, 所以必须同时记述预处理的方法。

物质名称：汞以及汞化合物		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>• 包装零部件和材料(参照 4.2.1 的内容)</li> <li>• 涂料、油墨</li> <li>• 计时器</li> <li>• 接点中使用汞的继电器、开关、传感器</li> <li>• 塑料中的添加剂</li> </ul>	立即执行
	<ul style="list-style-type: none"> <li>• 适用对象外以外的所有用途</li> </ul>	立即执行 (从 2005 年 1 月 1 日开始)
适用对象外	<ul style="list-style-type: none"> <li>• 小型日光灯 (液晶显示屏背光灯用等)、直管日光灯以外的灯(高压汞灯等)</li> <li>• 小型日光灯: 每支的含量小于 5 mg 的产品</li> <li>• 直管日光灯: 每支的含量小于 5 mg 的产品</li> </ul>	

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物质名称：六价铬化合物		
对象		禁止供货时期
1 级	· 包装零部件和材料(参照 4.2.1 的内容)	立即执行
	· 包含在零部件和材料成分中的涂料、油墨以及其他添加剂等 · 在电镀、化学转化处理等的表面处理(螺丝、钢板等)过程中,残留在被处理部位的物质	立即执行 (从 2005 年 1 月 1 日开始)

物质名称：多氯联苯 (PCB)、多氯化萘 (PCN)、多氯三联苯 (PCT)		
对象		禁止供货时期
1 级	· 油浸变压器、电容器、绝缘油、润滑油、塑料用的阻燃剂等的所有用途	立即执行

物质名称：短链型氯代烷烃 (SCCP)		
对象为「碳链长为 10—13 的短链型氯代烷烃」		
对象		禁止供货时期
1 级	· 用于包括附件在内的产品外框(机壳)、印刷线路板的用途时	立即执行
	· 上述以外的所有用途	立即执行 (从 2006 年 2 月 1 日开始)

物质名称：其他有机氯化物		
对象		禁止供货时期
3 级	· 用于塑料的阻燃剂和增塑剂,以及印刷线路板等的阻燃剂用途时	

物质名称：多溴联苯 (PBB)		
对象		禁止供货时期
1 级	· 用于塑料的阻燃剂等的所有用途	立即执行

物质名称：包含十溴联苯醚 (DecaBDE) 的多溴联苯醚 (PBDE)		
对象		禁止供货时期
1 级	· 用于塑料的阻燃剂等的所有用途	立即执行
	· 使用 2002 年 12 月以前启用的模具所制造的零部件 (限定为：出口欧洲以外国家的电视、显示器的框体) 但是，2003 年 1 月以后启用的模具零部件中禁止使用本项物质	立即执行 (从 2005 年 1 月 1 日开始)

物质名称：其他有机溴化合物		
对象		禁止供货时期
3 级	· 用于塑料的阻燃剂和印刷线路板等的阻燃剂之用途	

物质名称：三丁基锡化合物 (TBT)、三苯基锡化合物 (TPT)		
对象		禁止供货时期
1 级	· 用于涂料、油墨、防腐剂、杀霉剂等的所有用途	立即执行

物质名称：石棉		
对象		禁止供货时期
1 级	· 用于绝缘材、填料等的所有用途	立即执行

物质名称：特定偶氮化合物		
对象为：按照欧盟·欧盟化学品限制指令 76/769/EEC 中引用的试验法进行分解，生成表 4.2a 的特定胺化合物之特定偶氮化合物，以及 4.2a 的特定胺化合物		
对象		禁止供货时期
1 级	· 与人体持续接触的产品，其接触人体部位(入耳式耳机、头戴式耳机、肩包的肩垫、皮带、绳索等)所使用的颜料	立即执行
3 级	· 不与人体持续接触的产品或零部件(遥控指挥器、胶垫、携带笔记本电脑专用包、鼠标等)	
试验法(参考) 分解偶氮化合物，提取胺的方法如下所述： (1) EN 14362-1: 2003 (2) CEN ISO/TS 17234: 2003 (3) EN 14362-2: 2003		

表 4.2a 特定胺化合物一览表

CAS No.	特定胺名称
92-67-1	4-氨基联苯
92-87-5	联苯胺
95-69-2	4-氯邻甲苯胺
91-59-8	2-萘胺
97-56-3	邻氨基偶氮甲苯
99-55-8	2-氨基-4-硝基甲苯
106-47-8	4-氯苯胺
615-05-4	2,4-二氨基苯甲醚
101-77-9	4,4'-二氨基二苯甲烷
91-94-1	3,3'-二氯联苯胺
119-90-4	3,3'-二甲氧基联苯胺
119-93-7	3,3'-二甲基联苯胺
838-88-0	3,3'-二甲基-4,4'-二氨基二苯甲烷
120-71-8	5-甲基邻茴香甲胺
101-14-4	4,4'-二氨基-3,3'-二氯二苯甲烷
101-80-4	4,4'-二氨基联苯醚
139-65-1	4,4'-二氨基二苯硫醚
95-53-4	邻甲苯胺
95-80-7	2,4-二氨基甲苯
137-17-7	2,4,5-三甲基苯胺
90-04-0	邻甲氧基苯胺
60-09-3	4-氨基偶氮苯

物质名称：甲醛		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>出口欧洲的产品中使用的纤维板 (Fiberboard)、刨花板 (particleboard)，以及使用胶合板的木制品 (例如，扬声器、机架等)</li> </ul>	立即执行
	<ul style="list-style-type: none"> <li>非出口欧洲的产品中使用的纤维板 (Fiberboard)、刨花板 (particleboard)，以及使用胶合板的木制品 (例如，扬声器、机架等)</li> </ul>	立即执行 (从 2005 年 1 月 1 日开始)
<p>标准值 (排放浓度)：采用如下方法中的其中一种方法。</p> <p>(1) 测试室法 12 m<sup>3</sup>、1 m<sup>3</sup> 或 0.0225 m<sup>3</sup> 的气密试验槽中，其浓度在 0.1 ppm 以下 (小于或等于 0.124 mg/m<sup>3</sup>)</p> <p>(2) 穿孔法</p> <ul style="list-style-type: none"> <li>未经表面处理的 100g 刨花板中的标准值应为小于或等于 6.5 mg (6 个月的平均值)</li> <li>未经表面处理的 100g 纤维板中的标准值应为小于或等于 7.0 mg (6 个月的平均值)</li> </ul> <p>或者</p> <ul style="list-style-type: none"> <li>未经表面处理的 100g 刨花板及纤维板中的标准值应为小于或等于 8.0 mg (这里是指遵照如下 (2) 中的 EN 120 规定之 1 次的测定值)</li> </ul> <p>(3) 干燥器法 平均标准值应为小于或等于 0.5 mg/l，最大的标准值应为小于或等于 0.7 mg/l (用 N = 2 来确认平均值、最大值)</p>		
<p>测定法：(1) 测试室法依照 EN 717-1: 2004</p> <p>(2) 穿孔法依照 EN 120: 1992</p> <p>(3) 干燥器法依照 JIS A 5905 (Fiberboards)、JIS A 5908 (Particleboards) 规定</p>		

物质名称：聚氯乙烯 (PVC) 以及聚氯乙烯混合物		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>非接触 IC 卡 (FeliCa) 用基材</li> </ul>	立即执行 (一开始生产时就未使用本对象物质)
	<ul style="list-style-type: none"> <li>电脑、数码相机、摄像机、便携式多媒体播放器等所使用的配件背包、专用携带配件盒、配件腰包的材料和涂装剂 (但是，业务用除外)</li> </ul>	立即执行
	<ul style="list-style-type: none"> <li>捆绑附件、连接电源线的扎线带 (cable tie)</li> </ul>	立即执行 (从 2002 年 7 月 1 日开始)
	<ul style="list-style-type: none"> <li>产品以及与产品一同包装的附件等使用的包装零部件和材料 (袋、胶带 (adhesive tape)、纸箱、泡罩包装等)</li> </ul>	立即执行 (从 2005 年 1 月 1 日开始)
	<ul style="list-style-type: none"> <li>热收缩软管</li> </ul>	立即执行 (从 2005 年 4 月 1 日开始)
	<ul style="list-style-type: none"> <li>扁型软电线 (FFC)</li> <li>木制扬声器外装部分采用的片材 (Sheet)、层压板</li> <li>绝缘板、装饰板、标签、片材 (例如，绝缘 Sheet、保护膜等)、层压板</li> </ul>	立即执行 (从 2007 年 4 月 1 日开始)

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物质名称：聚氯乙烯(PVC)以及聚氯乙烯混合物		禁止供货时期
对象		
3 级	<ul style="list-style-type: none"> <li>· 连接电缆(1)：便携型机器用电缆(例如，入耳式耳机、头戴式耳机、耳戴式麦克风用的电缆等)</li> <li>· 机器内外部使用的绝缘和保护用的涂层、绝缘软管、携带用挂带(carrying belt)、垫片(spacer)、holder(是指固定用的零部件)、套管·保护盖(cover)、配线槽(duct)等</li> <li>· 出口日本、美国、加拿大的电源线(包括插头、连接器、电线套筒)：「2P与3P」</li> <li>· 使用线材(带电缆的连接器等)的零部件以及机体内布线用线材(马达引线等)</li> <li>· 连接电缆(2)：USB 用电缆、i.LINK 用电缆、录像机电缆、AC 适配器次级引线、扁平线、多芯绞合型电缆、扬声器电缆等</li> <li>· 束线、加工线材(同轴电缆、扁平线、双重屏蔽电线、屏蔽线等)</li> <li>· 业务用电子产品用配件背包、专用携带配件盒、配件腰包的材料及涂装剂</li> <li>· 印相纸(照相纸)</li> <li>· 作为电容器、电源开关、保险丝用途的绝缘盖</li> <li>· 零部件交货厂商用于包装零部件的托盘、料条(装运管)、带盘、压纹承载带等</li> <li>· 安装车用机器(In-vehicle product)的吸盘</li> <li>· 用于机器内部的配线用夹(用聚氯乙烯涂装过的金属物品)</li> </ul> <p>除此之外，还包括本项中未列举的零部件(但是「1级」及「适用对象外」中所列举的除外)</p>	
适用对象外	<ul style="list-style-type: none"> <li>· 树脂用粘料(粘接料)</li> <li>· 高压塑料电线</li> <li>· 绝缘带</li> <li>· 扬声器的格栅(Speaker grille)</li> <li>· 电源线(上述3级中所述，出口日本、美国、加拿大以外地区的电源线)</li> <li>· 含有氯乙烯共聚物，以及聚氯乙烯与其他聚合物的混合物之零部件。但是上述1级与3级所指定的零部件除外</li> <li>· 变压器的引线部分(清漆浸渍的部分)</li> <li>· 卷线</li> <li>· AWG36 以上的极细电线</li> <li>· 不能使用通用电缆的业务用机器所采用的电缆(例如，广播电视台用摄像机电缆、麦克风电缆等)</li> </ul>	

物质名称：氧化铍		
对象		禁止供货时期
1 级	· 管理级别 3 级以外的所有用途	从 2008 年 4 月 1 日开始
3 级	· 无替代物之特殊用途的产品或零部件	

物质名称：铍青铜		
对象		禁止供货时期
3 级	· 所有用途	

物质名称：特定邻苯二甲酸盐 (DEHP、DBP、BBP、DINP、DIDP、DNOP、DNHP)		
对象为表 4. 2b 的物质		
对象		禁止供货时期
3 级	· 用于电缆绝缘、电源线绝缘，及其对应的插头或连接器部位的聚氯乙烯树脂含有增塑剂用途的特定邻苯二甲酸盐时	

表 4. 2b 特定邻苯二甲酸盐 (邻苯二甲酸盐) 一览表

简称	CAS 号码	名称
DEHP	117-81-7	邻苯二甲酸 (2-乙基己基酯)
DBP	84-74-2	邻苯二甲酸二丁酯
BBP	85-68-7	邻苯二甲酸丁苄酯
DINP	28553-12-0 68515-48-0	邻苯二甲酸二异壬酯
DIDP	26761-40-0 68515-49-1	邻苯二甲酸二异癸酯
DNOP	117-84-0	邻苯二甲酸二正辛酯
DNHP	84-75-3	邻苯二甲酸二己酯

物质名称：氢氟碳化合物 (HFC)、全氟化碳 (PFC)		
对象		禁止供货时期
1 级	· 用于制冷剂、隔热材料等产品的所有用途	立即执行 (从 2008 年 4 月 1 日开始)

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物质名称：全氟辛烷磺酸(及其盐) (PFOS)		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>· 零部件采用的材料中的 PFOS 浓度大于或等于 0.1wt%时</li> <li>· 每个涂布材料(包括纤维或是其他的涂布材料)中的 PFOS 含量大于或等于 1 <math>\mu\text{g}/\text{m}^2</math> 时</li> </ul> 例如， 电镀、涂料、颜料、燃料、用拒水剂/拒油剂/防污剂等涂布的材料(纤维、薄膜、纸、皮革等)、氟聚合物树脂涂层、粘结剂、密封胶(sealant)等	立即执行 (从 2008 年 4 月 1 日开始)
2 级	<ul style="list-style-type: none"> <li>· 1 级和适用对象外以外的所有用途</li> </ul>	2010 年 4 月 1 日开始
适用对象外	<ul style="list-style-type: none"> <li>· 用于薄膜、纸和印刷版材中的照片用涂布剂</li> <li>· 光刻工艺采用的光刻胶或是防止反射用的涂布剂</li> </ul>	

物质名称：特定苯并三氮唑		
对象为「2-(3',5'-二叔丁基-2'-羟基苯基)苯并三唑(CAS No. 3846-71-7)」		
对象		禁止供货时期
1 级	用于以下产品中作为紫外线防护剂、紫外线吸收剂用途的特定苯并三氮唑 <ul style="list-style-type: none"> <li>· 装饰性层压板</li> <li>· 印相纸(照相纸)</li> <li>· 成型塑料产品</li> </ul>	立即执行 (从 2008 年 4 月 1 日开始)

物质名称：二氯化钴		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>· 用于干燥剂(硅胶等)中的湿度指示剂</li> </ul>	立即执行 (从 2009 年 4 月 1 日开始)
2 级	湿度指示剂(湿度显示卡) (注)所指的湿度指示剂,是将二氯化钴浸渍到纸等里面的吸湿类型	2011 年 4 月 1 日开始

物质名称：臭氧层破坏物质（ODS）		
表 4.2c 的物质		
对象		禁止供货时期
1 级	<ul style="list-style-type: none"> <li>• 用于制冷剂、隔热材料等产品的所有用途</li> <li>• 使用 ODS 实施清洗加工、发泡加工等的零部件和材料</li> </ul>	立即执行

表 4.2c 臭氧层破坏物质（ODS）一览表

CAS No.	名称
75-69-4	CFC-11
75-71-8	CFC-12
76-13-1	CFC-113
76-14-2	CFC-114
76-15-3	CFC-115
353-59-3	Halon-1211
75-63-8	Halon-1301
124-73-2	Halon-2402
75-72-9	CFC-13
354-56-3	CFC-111
76-12-0	CFC-112
422-78-6	CFC-211
3182-26-1	CFC-212
165-97-7	CFC-213
29255-31-0	CFC-214
4259-43-2	CFC-215
661-97-2	CFC-216
422-86-6	CFC-217
56-23-5	四氯化碳
71-55-6	1, 1, 1-三氯乙烷

## 4.2 有关包装零部件和材料的追加事项

### 4.2.1 包装零部件和材料的定义

包装零部件和材料是指：生产者为了将产品(包括原材料到加工品)以「装入」、「保护」、「处理」、「运送」、「交付」等方式送到使用者或消费者手中，使用各类材料及零部件制成的产品。

(注) 但是，在运输公司或零部件交货厂商的管理下回收且再次使用的物流箱等的包装除外。在此所指的物流箱等不包含在由索尼集团内部或终端用户废弃的包装材料中。

表 4.3 有关包装零部件和材料的追加事项

物质名称：重金属 (镉、铅、六价铬、汞)	
除 4.1 项(表 4.2)的规定外，还需遵守法律规定，同时符合以下条件	
对象	
1 级	· 对象为表 4.3a 中记载的包装零部件和材料
适用对象外	· 运输公司或零部件交货厂商所使用的物流箱除外
禁止供货时期	
立即执行	
允许浓度：	
<ul style="list-style-type: none"> <li>汞、镉、六价铬、铅的重金属允许浓度，依照组成包装时的各零部件材料、油墨、涂料的类别，规定为重金属的合计应小于 100 ppm。但是，在塑料(包括橡胶)、涂料、油墨各相应部位中的含镉或铅的允许浓度，应符合「镉和镉化合物」及「铅和铅化合物」的规定。 【主要的塑料部位：提手、塑料袋、缓冲材料、薄膜、托盘、带盘、胶带(adhesive tape)、料条(装运管(包括止动器))、打包带等】</li> </ul>	
<p>(1)对于六价铬的分析，首先分析总铬的量，确认 4 种元素合计小于 100 ppm。此时，可以与镉和铅同时进行预处理。</p> <p>(2)如果 4 种元素合计大于或等于 100 ppm 时，必需确认镉、铅、汞 3 种元素的合计含量小于 100 ppm。当镉、铅、汞的合计含量小于 100 ppm 时，再进一步实施六价铬的检测判定。最后应确认没有检测到六价铬。</p>	
测定标准：	
(1)预处理	
在此规定镉和铅的预处理方法，应依照塑料中的镉(*3)和铅(*4)的规定处理。 另外，总铬的预处理方法也是依照塑料中的镉(*3)的规定处理。	
汞的预处理方法主要有下列 3 种：	
<ol style="list-style-type: none"> <li>在密闭容器内进行的加压酸分解法(包括微波分解法)(例如，EPA 3052: 1996 或者 IEC62321: 2008)</li> <li>加热气化-冷原子吸光法(例如，IEC62321: 2008)</li> <li>将硫酸、硝酸放入附带回流冷凝器的分解烧瓶(基耶达尔法)中进行的湿式分解法等</li> </ol>	
(注) 必须注意无论采用何种方法都不能让汞挥发。另外，产生沉淀物时，必须采取某种方法完全溶解该沉淀物。	
(2)测定法	
在此规定镉、铅、总铬的测定法，应依照塑料中的镉(*3)和铅(*4)的规定进行。 另外，汞的测定方法也是依照塑料中的镉(*3)和铅(*4)的规定进行。但是，预估包装零部件和材料中可能混入低浓度的汞时，如下分析方法较为适合：还原气化原子吸光法、附带氢气发生器的 ICP-AES (ICP-OES) 与附带氢气发生器的 ICP-MS。	

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## 六价格的检测判定

这是为了确认包装零部件和材料中的镉、铅、汞、总铬4种元素合计是否大于或等于100 ppm的方法。

## 检测方法：

## (1) 预处理

萃取法[沸水萃取法、碱萃取法(例如, EPA 3060A 或者 IEC62321: 2008 Annex C)]

## (2) 测定法

紫外-可见光分光光度法(例如, EPA 7196A 或者 IEC62321: 2008 Annex C))

如果本测定标准是组合了预处理和测定法, 其结果可以保证个别的定量下限值为: 汞小于5ppm、镉小于5ppm、总铬小于5ppm、铅小于30ppm时, 则规定该组合所得到的测定结果合格。

此外, 镉、铅、总铬量可以同时采用第5页(\*3)或第7页(\*4) (2)中的测定法进行分析, 但是「2. 原子吸收分光光度法(AAS)」的方法除外。

- (\*3) 参照「表 4.2 关于环境管理物质的主要对象和禁止供货时期」中的物质名称: 镉以及镉化合物、测定对象: 塑料(包括橡胶)、涂料、油墨。
- (\*4) 参照「表 4.2 关于环境管理物质的主要对象和禁止供货时期」中的物质名称: 铅以及铅化合物、测定对象: 塑料(包括橡胶)、涂料、油墨。

表 4.3a 识别包装零部件和材料的具体例子

(注) 本表并不是网罗所有的包装零部件和材料。

用于包装消费者用产品以及业务用产品的包装零部件和材料(用于运输索尼电子产品的包装零部件和材料)		
PACKAGING		
1.	纸箱(箱子)	由各种材料制成的个装箱、辅助纸箱、主纸箱
2.	缓冲材料	
3.	防护带(片材(sheet))	泡沫塑料或不织布等
4.	塑料袋	
5.	信封	装保证书的信封等
6.	泡罩包装	
7.	薄膜	包含粘贴液晶显示器表面等的防护膜
8.	对折泡壳	
9.	隔离板/间隔物(spacer)	
10.	印刷油墨	用于印刷包装零部件的油墨
11.	胶带(adhesive tape)	用于封缄纸箱、塑料袋, 以及保护和固定可动部分的胶带
12.	U形钉	
13.	标签	在索尼的监督管理下粘贴于包装零部件上的标签, 例如条形码标签
14.	接头(joint)	粘接纸箱等
15.	打包带	PP 打包带等
16.	挂钩(hang tab)	
17.	提手	提手及其构成零部件
18.	外框	木框等
19.	热收缩薄膜	
20.	瓶	
21.	套筒	
22.	装饰箱	例如装钢笔或化妆品的装饰箱
23.	防滑垫	

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NOT PACKAGING		
1.	CD 盒子/袋	属于产品的一部分，用于录像带、CD、MO、MD、DVD 等的盒子、袋、芯轴等
2.	检索卡片/标签	属于产品的一部分，附属于 CD 或其他记录媒体的检索卡片或标签等
3.	专用携带配件盒/配件腰包	属于产品的一部分，耳机、照相机、WALKMAN®随身听等的附属品
4.	标签	粘贴在产品上等的标签，但包装零部件和材料上的标签除外
5.	标签	由第 3 者粘贴的货物标签或发票等

器件、半导体以及其他零部件使用的包装零部件和材料		
PACKAGING		
1.	料条(装运管)	用于运输 IC 等的包装零部件
2.	止动器	
3.	托盘	
4.	带盘	

物流采用的包装零部件和材料		
PACKAGING		
1.	板条托盘	包括滑托板之木制、塑料制、纸制等 One-Way 规格的托盘
2.	板条箱	
3.	缠绕膜(拉伸膜)	防止货物变形等用
4.	木制集装箱	
5.	辅助包装采用的包装材料	运输零部件时的辅助包装所采用的纸箱、缓冲材料、胶带(adhesive tape)等
6.	打包带/绳	PP 打包带等
NOT PACKAGING		
1.	轮船和空运集装箱	轮船输送用 40 英尺集装箱、空运集装箱等

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### 4.3 有关电池的事项(适用于：与产品同时包装或另外出售等所有商品的流通形式)

#### 4.3.1 关于本技术标准中的「电池」、「电池组」以及「钮扣电池」的定义

「电池」是指：通过直接变换化学能源，使其产生电气能源。它是由单一或复数个一次电池(即原电池 primary battery：不能再充电)，或是单一或复数个二次电池(即蓄电池 secondary battery：可再充电)所组成的。

「电池组」是指：由复数的电池相互连接，且终端用户(end-user)无企图分解，即以全套装置(complete unit)的形式安装于外壳(outer casing)中的电池套组。

「钮扣电池」是指：其直径比高度长，外形小并且为圆形的携带型「电池」。因特别的目的在于助听器、腕表、小型可携带式机器产品、备用电源等中的电池。

因「电池组」采用的电池也是归纳为「电池」，所以适用表 4.4 记载的规定。

此外，「电池」及「电池组」相关的内容，应依照本技术标准的 4.1 及 4.2 项的规定进行。

表 4.4 有关电池的事项

物质名称：重金属(镉、铅、汞)			
对象			禁止供货时期
1 级	镉(Cd)	· 镍/镉电池。	立即执行 (从2007年1月1日开始)
		· 「电池」：镉含量大于或等于电池总重量 20 ppm 的电池。 · 「电池组」：镉含量大于或等于电池总重量 20 ppm 的电池组。	立即执行 (从2008年1月1日开始)
	铅(Pb)	· 「电池」：铅含量大于或等于电池总重量 0.4%的电池。 · 「电池组」：铅含量大于或等于电池总重量 0.4%的电池组。	立即执行 (从2005年1月1日开始)
		· 碳性电池和碱锰电池：铅含量大于或等于电池总重量 0.2%的电池。	立即执行 (从2008年4月1日开始) (*5)
	汞(Hg)	· 「钮扣电池」：汞含量大于或等于电池总重量 2%的钮扣电池。 · 「钮扣电池」以外的 「电池」：汞含量大于或等于电池总重量 0.0005%的电池。 「电池组」：汞含量大于或等于电池总重量 0.0005%的电池组。	立即执行
		· 碳性电池和碱锰电池：汞含量大于或等于电池总重量 0.0001%的电池。	立即执行 (从2008年4月1日开始) (*6)

(\*5) 出口阿根廷的电池产品必须遵守阿根廷的电池法规，于 2007 年 1 月 29 日的禁止供货时期开始执行相关规定。

(\*6) 出口中国的电池产品必须遵守「关于限制电池产品汞含量的规定」，于 2005 年 1 月 1 日的禁止供货时期开始执行相关规定。

## 附属资料

### 1. 世界各国和地区就物质使用所实施的法律法规(主要示例)

### 2. 所属物质的详细信息(主要示例)

- 镉以及镉化合物
- 铅以及铅化合物
- 汞以及汞化合物
- 六价铬化合物
- 多氯联苯(PCB)、多氯化萘(PCN)、多氯三联苯(PCT)
- 短链型氯化萘(SCCP)
- 多溴联苯(PBB)
- 多溴联苯醚(PBDE)
- 三丁基锡化合物(TBT)、三苯基锡化合物(TPT)
- 石棉
- 特定偶氮化合物
- 甲醛
- 聚氯乙烯(PVC)以及聚氯乙烯混合物
- 氧化铍
- 氢氟碳化合物(HFC)、全氟化碳(PFC)
- 全氟辛烷磺酸(及其盐)(PFOS)
- 特定苯并三氮唑
- 二氯化钴

注意事项：本附属资料 1 和 2 中所列举的法令及化学物质仅为示例，并不是汇总全部的内容。也就是说，某些化学物质可能不在本表中。

## 1. 世界各国和地区就物质的使用所实施的法律法规(主要示例)

(注) 以下登载的是截至 2009 年 3 月底已确认的内容。由于法律法规的内容会有变动, 因此请参照各国的法律法规以确认最新版的详细内容。

物质名称	法律法规
镉以及镉化合物	欧盟·欧盟化学品限制指令(76/769/EEC)及其修订版
	欧盟·欧盟镉指令(91/338/EEC)及其修订版
	欧盟·RoHS 指令(2002/95/EC)及其修订版
	欧盟·电池指令(2006/66/EC)
	瑞士·减少化学品风险条令(*简称 ORRChem) 等
铅以及铅化合物	欧盟·RoHS 指令(2002/95/EC)及其修订版
	欧盟·电池指令(2006/66/EC)
	瑞士·减少化学品风险条令(*简称 ORRChem)
	丹麦·指令 No. 1012 及其修订版
	阿根廷·便携式电气能源法律 26, 184 号及决议 14/2007 等
汞以及汞化合物	欧盟·RoHS 指令(2002/95/EC)及其修订版
	欧盟·电池指令(2006/66/EC)
	中国·关于限制电池产品汞含量的规定
	中国·进出口电池产品汞含量检验监管办法 等
六价铬化合物	欧盟·RoHS 指令(2002/95/EC)及其修订版
	瑞士·减少化学品风险条令(*简称 ORRChem) 等
多氯联苯(PCB)、 多氯化萘(PCN)、 多氯三联苯(PCT)	欧盟·欧盟化学品限制指令(76/769/EEC)及其修订版
	日本·化学物质审查规制法(*简称化审法) 第 1 种特定化学物质 等
短链型氯代烷烃(SCCP)	挪威·对特定有害化学物质使用等相关限制 等
多溴联苯(PBB)	欧盟·欧盟化学品限制指令(76/769/EEC)及其修订版
	欧盟·RoHS 指令(2002/95/EC)及其修订版
	瑞士·减少化学品风险条令(*简称 ORRChem) 等
多溴联苯醚(PBDE)	欧盟·欧盟化学品限制指令(76/769/EEC)及其修订版
	欧盟·RoHS 指令(2002/95/EC)及其修订版
	瑞士·减少化学品风险条令(*简称 ORRChem) 等
三丁基锡化合物(TBT)、 三苯基锡化合物(TPT)	日本·化学物质审查规制法(简称化审法) 第 1 种、第 2 种特定化学物质 等
石棉	日本·劳动安全卫生法
	德国·化学品禁止规则(简称 ChemVerbotsV) 等
特定偶氮化合物	欧盟·欧盟化学品限制指令(76/769/EEC)以其修订版 等
甲醛	德国·化学品禁止规则(简称 ChemVerbotsV)
	丹麦·指令 No. 289 等
重金属(镉、汞、六价铬)	欧盟·有关包装以及包装废弃物指令(94/62/EC)及其修订版
	美国·纽约州等 16 个州的包装材料重金属规定 等

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物质名称	法律法规
氧化铍	欧盟·WEEE 指令(2002/96/EC)及欧盟·欧盟指令(1999/45/EC) 等
氢氟碳化合物(HFC)、全氟化碳(PFC)	欧盟·欧盟法规(2006/842/EC)
	丹麦·指令 No. 552
	瑞士·减少化学品风险条令(简称 ORRChem) 等
全氟辛烷磺酸(及其盐) (PFOS)	欧盟·欧盟化学品限制指令(76/769/EEC)及其修订版 等
特定苯并三氮唑	日本·化学物质审查规制法(简称化审法) 第1种特定化学物质
二氯化钴	欧盟·欧盟指令(76/769/EEC)及其修订版 等
臭氧层破坏物质(ODS)	欧盟·欧盟法规(EC) No. 2037/2000及其修订版。
	日本·关于通过对特定物质的控制等措施保护臭氧层的法律
	美国·1990年的清洁空气法案修订案
	印度尼西亚·Regulation of the Minister of Industry of the Republic of Indonesia No. 33/M-IND/PER/4/2007 dated April 17, 2007 等

## 2. 所属物质的详细信息(典型实例)

## ● 镉以及镉化合物

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
镉	Cadmium	7440-43-9	Cd	接点材料、表面处理、镍镉电池
镉合金	Cadmium alloys			低熔点焊锡、保险丝等
氧化镉	Cadmium oxide	1306-19-0	CdO	颜料、碱性电池、化学合成材料
氯化镉	Cadmium chloride	10108-64-2	CdCl <sub>2</sub>	电镀浴(液)、聚氯乙烯的稳定剂
硫化镉; 镉黄	Cadmium sulfide	1306-23-6; 8048-07-5	CdS	颜料、半导体受光元件、油漆、油墨
硝酸镉	Cadmium nitrate	10325-94-7	Cd(NO <sub>3</sub> ) <sub>2</sub>	着色剂、电池、相片
四水合硝酸镉	Cadmium nitrate tetrahydrate	10022-68-1	Cd(NO <sub>3</sub> ) <sub>2</sub> · 4H <sub>2</sub> O	
硫酸镉	Cadmium sulfate	10124-36-4	CdSO <sub>4</sub>	镉电池、电镀光泽剂、试剂
硬脂酸镉	Cadmium stearate	2223-93-0	Cd(C <sub>18</sub> H <sub>35</sub> O <sub>2</sub> ) <sub>2</sub>	聚氯乙烯的稳定剂
其他镉化合物	Other cadmium compounds			

## ● 铅以及铅化合物

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
铅；金属铅	Lead metal	7439-92-1	Pb	
铅-锡合金	Lead-tin alloy		Pb-Sn	焊锡、硬焊材料(brazing material)、电气接点
氧化铅；一氧化铅；氧化亚铅； 氧化铅(II)；密陀僧(黄铅)；黄丹	Lead (II) oxide	1317-36-8	PbO	颜料、橡胶硫化促进剂、固体润滑剂
二氧化铅；氧化高铅；过氧化铅	Lead (IV) oxide	1309-60-0	PbO <sub>2</sub>	铅蓄电池、橡胶固化剂、颜料的原料
三氧化二铅；	Dilead trioxide	1314-27-8	Pb <sub>2</sub> O <sub>3</sub>	
四氧化三铅；铅丹；红丹	Lead (II, IV) oxide	1314-41-6	Pb <sub>3</sub> O <sub>4</sub>	颜料、铅蓄电池、玻璃、涂料
叠氮化铅；铅叠氮化物	Lead azide	13424-46-9	PbN <sub>6</sub>	
二氟化铅；氟化亚铅；氟化铅(II)	Lead (II) fluoride	7783-46-2	PbF <sub>2</sub>	特殊光学玻璃、颜料
二氯化铅；氯化铅(II)；氯化铅	Lead (II) chloride	7758-95-4	PbCl <sub>2</sub>	
四氯化铅；氯化铅(IV)	Lead (IV) chloride	13463-30-4	PbCl <sub>4</sub>	
碘化亚铅；碘化铅(II)	Lead (II) iodide	10101-63-0	PbI <sub>2</sub>	青铜、印刷、相片
硫化铅(II)	Lead (II) sulfide	1314-87-0	PbS	半导体红外线检测器
氰化铅(II)	Lead (II) cyanide	592-05-2	Pb(CN) <sub>2</sub>	防锈颜料
氟硼酸铅	Lead tetrafluoroborate	13814-96-5	Pb(BF <sub>4</sub> ) <sub>2</sub>	电镀浴(液)、耐腐蚀表面处理
六氟硅酸铅	Lead hexafluorosilicate	25808-74-6	PbSiF <sub>6</sub>	电镀浴(液)、铅精炼
硝酸铅	Lead nitrate	10099-74-8	Pb(NO <sub>3</sub> ) <sub>2</sub>	光学玻璃
碳酸铅	Lead carbonate	598-63-0	PbCO <sub>3</sub>	
碱式碳酸铅；盐基碳酸铅；铅白	Lead hydroxycarbonate	1344-36-1	(PbCO <sub>3</sub> ) <sub>2</sub> Pb(OH) <sub>2</sub>	颜料、聚氯乙烯的稳定剂
过氯酸铅	Lead perchlorate	13637-76-8	Pb(ClO <sub>4</sub> ) <sub>2</sub>	
硫酸亚铅；硫酸铅(II)	Lead (II) sulfate	7446-14-2; 15739-80-7	PbSO <sub>4</sub>	颜料、橡胶配合剂、聚氯乙烯的稳定剂、电池
三盐基硫酸铅	Lead oxide sulfate	12202-17-4	Pb <sub>4</sub> SO <sub>7</sub>	颜料
磷酸铅	Lead (II) phosphate	7446-27-7	Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	塑料稳定剂
硫氰酸铅	Lead thiocyanate	592-87-0	Pb(SCN) <sub>2</sub>	染色、火柴
三水合乙酸铅；三水醋酸铅(II)	Lead(II) acetate, trihydrate	6080-56-4	Pb(CH <sub>3</sub> COO) <sub>2</sub> · 3H <sub>2</sub> O	
乙酸铅；醋酸铅(II)；铅糖	Lead(II) acetate	301-04-2	Pb(CH <sub>3</sub> COO) <sub>2</sub>	
乙酸高铅盐；四乙酸铅	Lead(IV) acetate	546-67-8	Pb(CH <sub>3</sub> COO) <sub>4</sub>	

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中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
油酸铅	Lead oleate	1120-46-3	$\text{Pb}[\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COO}]_2$	润滑剂、硬化剂等
硬脂酸铅	Lead stearate	7428-48-0	$\text{Pb}(\text{C}_{17}\text{H}_{35}\text{COO})_2$	聚氯乙烯的稳定剂、润滑剂
硼酸铅	Lead(II) metaborate	10214-39-8	$\text{Pb}(\text{BO}_2)_2 \cdot \text{H}_2\text{O}$	油漆的干燥剂
硅酸铅	Lead metasilicate	11120-22-2; 10099-76-0	$\text{PbSiO}_3$	陶瓷
锑酸铅	Lead antimonate	13510-89-9	$\text{Pb}_3(\text{SbO}_4)_2$	颜料、玻璃着色
砷酸铅; 砷酸氢铅; 酸性砷酸铅	Lead arsenate(1:1)	7784-40-9	$\text{PbHAsO}_4$	
亚砷酸铅	Lead(II) arsenite	10031-13-7	$\text{Pb}(\text{AsO}_2)_2$	杀虫剂
铬酸铅; 铬黄	Lead chromate; chrome yellow	1344-37-2	$\text{PbCrO}_4$	颜料、涂料、油墨
钼酸铅	Lead molybdate	10190-55-3	$\text{PbMoO}_4$	颜料
铅酸钙	Calcium plumbate	12013-69-3	$\text{Ca}_2\text{PbO}_4$	氧化剂
四甲基铅; 四甲铅; TML	Tetramethyllead	75-74-1	$\text{Pb}(\text{CH}_3)_4$	
四乙基铅; 四乙铅; TEL	Tetraethyllead	78-00-2	$\text{Pb}(\text{C}_2\text{H}_5)_4$	
其他铅化合物以及合金	Other lead compounds and alloys			

## ●汞以及汞化合物

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
汞；金属汞	Mercury	7439-97-6	Hg	电极、汞灯
汞合金；汞齐	Mercury alloys ; amalgam			
氧化亚汞；氧化汞(I)	Mercury(I)oxide	15829-53-5	Hg <sub>2</sub> O	
一氧化汞；氧化汞(II)	Mercury(II)oxide	21908-53-2	HgO	汞电池、防腐剂
氯化亚汞；氯化汞(I)；甘汞	Mercury(I)chloride	10112-91-1	Hg <sub>2</sub> Cl <sub>2</sub>	电极、颜料
二氯化汞；氯化汞(II)；升汞	Mercury(II)chloride	7487-94-7	HgCl <sub>2</sub>	金属蚀刻、干电 池、防腐剂
硝酸汞；硝酸汞(II)	Mercury(II)nitrate	10045-94-0	Hg(NO <sub>3</sub> ) <sub>2</sub>	毛毡、催化剂
硫酸亚汞；硫酸汞(I)	Mercury(I)sulfate	7783-36-0	Hg <sub>2</sub> SO <sub>4</sub>	电池
雷汞；雷酸汞(II)	Mercury(II) fulminate	628-86-4	Hg(ONC) <sub>2</sub>	
乙酸汞；醋酸汞(II)	Mercury(II)acetate	1600-27-7	Hg(CH <sub>3</sub> COO) <sub>2</sub>	
甲基汞盐	Methylmercury salts	e. g. 22967-92-6	CH <sub>3</sub> HgX ; X=Cl, Br, I, OH, etc.	防霉剂
乙基汞盐	Ethylmercury salts		C <sub>2</sub> H <sub>5</sub> HgX ; X=Cl, Br, I, OH, etc.	防腐剂、杀菌剂
丙基汞盐	Propylmercury salts		C <sub>3</sub> H <sub>7</sub> HgX ; X=Cl, Br, I, OH, etc.	
苯基汞盐	Phenylmercury salts		C <sub>6</sub> H <sub>5</sub> HgX ; X=Cl, Br, I, OH, etc.	防腐剂、杀菌剂
甲氧基乙基汞盐	Methoxyethylmercury salts		CH <sub>3</sub> OC <sub>2</sub> H <sub>4</sub> HgX ; X=Cl, Br, I, OH, etc.	杀菌剂、防霉剂
二烷基汞	Dialkylmercury		R <sub>2</sub> Hg ; R=alkyl group (C <sub>n</sub> H <sub>2n+1</sub> )	
二苯汞	Diphenylmercury	587-85-9	(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> Hg	
其他汞化合物	Other mercury compounds			

## ●六价铬化合物

### 1. 所属物质的例子

仅含有六价的铬元素的物质才属于此类。

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
三氧化铬；氧化铬(VI)；无水铬酸；铬酸	Chromium(VI) oxide; chromium trioxide	1333-82-0	CrO <sub>3</sub>	颜料、催化剂、电镀、鞣革(Tanning)
铬酸锂	Lithium chromate	14307-35-8	Li <sub>2</sub> CrO <sub>4</sub>	防锈
铬酸钠	Sodium chromate	7775-11-3	Na <sub>2</sub> CrO <sub>4</sub>	防锈、鞣革(Tanning)
铬酸钾	Potassium chromate	7789-00-6	K <sub>2</sub> CrO <sub>4</sub>	颜料、油墨、鞣革(Tanning)
氯铬酸钾	Potassium chlorochromate	16037-50-6	K[CrO <sub>3</sub> Cl]	
铬酸铵	Ammonium chromate	7788-98-9	(NH <sub>4</sub> ) <sub>2</sub> CrO <sub>4</sub>	相片、催化剂
铬酸铜	Copper chromate	13548-42-0	CuCrO <sub>4</sub>	媒染剂
铬酸镁	Magnesium chromate	13423-61-5	MgCrO <sub>4</sub>	防锈、表面处理
铬酸钙；钙铬黄	Calcium chromate	13765-19-0	CaCrO <sub>4</sub>	颜料、油墨、鞣革(Tanning)
铬酸锶	Strontium chromate	7789-06-2	SrCrO <sub>4</sub>	颜料、防锈
铬酸钡	Barium chromate	10294-40-3	BaCrO <sub>4</sub>	防锈、颜料、陶瓷用着色剂
铬酸铅；铬黄	Lead chromate; chrome yellow	1344-37-2	PbCrO <sub>4</sub>	颜料、涂料、油墨
铬酸锌；黄锌；锌黄	Zinc chromate	12018-19-8; 13530-65-9; 14018-95-2	ZnCrO <sub>4</sub>	颜料、防锈
重铬酸钠	Sodium dichromate; sodium bichromate	10588-01-9	Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	颜料、防锈、相片、鞣革(Tanning)
重铬酸钾	Potassium dichromate; potassium bichromate	7778-50-9	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	颜料、相片、电镀、电池、鞣革(Tanning)
重铬酸铵	Ammonium dichromate; ammonium bichromate	7789-09-5	(NH <sub>4</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	颜料、相片、催化剂
重铬酸钙	Calcium dichromate; calcium bichromate	14307-33-6	CaCr <sub>2</sub> O <sub>7</sub>	防锈、催化剂
重铬酸锌	Zinc dichromate; zinc bichromate		ZnCr <sub>2</sub> O <sub>7</sub>	颜料
其他六价铬化合物	Other hexavalent chromium compounds			

●多氯联苯 (PCB)、多氯化萘 (PCN)、多氯三联苯 (PCT)

1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
PCB; 多氯联苯; 氯化联苯	PCB; polychlorinated biphenyls	1336-36-3	$C_{12}H_{10-x}Cl_x$ ( $x=1-10$ )	热载体、润滑剂和电容器油
PCN; 多氯化萘; 氯化萘	PCN; polychlorinated naphthalenes		$C_{10}H_{8-x}Cl_x$ ( $x \geq 3$ )	润滑剂、防腐剂、涂料
三氯化萘	Trichloronaphthalene	1321-65-9	$C_{10}H_5Cl_3$	
四氯化萘	Tetrachloronaphthalene	1335-88-2	$C_{10}H_4Cl_4$	
五氯化萘	Pentachloronaphthalene	1321-64-8	$C_{10}H_3Cl_5$	
八氯化萘	Octachloronaphthalene	2234-13-1	$C_{10}Cl_8$	
PCT; 多氯三联苯	PCT; polychlorinated terphenyls	61788-33-8	$C_{18}H_{14-x}Cl_x$ ( $x=1-14$ )	润滑剂、防腐剂、涂料

●短链型氯代烷烃 (SCCP)

1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
氯化烷烃; 短链氯化石蜡; 碳原子数 C10-13 氯代烃	Short-chain Chlorinated paraffins C10-13	e. g. 85535-84-8		增塑剂、阻燃剂

●多溴联苯 (PBB)

1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
PBB; 多溴联苯	PBB; Polybrominated biphenyls	e. g. 67774-32-7	$C_{12}H_{10-x}Br_x$ ( $x=1-10$ )	阻燃剂

## ●多溴联苯醚 (PBDE)

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
多溴二苯醚; 聚溴二苯醚; PBDE; PBDO; PBBE	Polybromodiphenyl ethers; polybromodiphenyloxides; polybrominated biphenyl ethers; PBDE; PBDO; PBBE		$C_{12}H_{10-x}Br_xO$ ( $x=1-10$ )	阻燃剂
十溴二苯醚; DBDE; DecaBDE; DBDPE; DBDPO	Decabromodiphenyl ether; decabromodiphenyloxiide; DBDE; DecaBDE; DBDPE; DBDPO	1163-19-5	$C_{12}Br_{10}O$	阻燃剂 (PE、 ABS、聚酯 用)
八溴二苯醚; OBDE; OctaBDE	Octabromodiphenyl ether; octabromodiphenyloxiide; OBDE; OctaBDE	32536-52-0	$C_{12}H_2Br_8O$	阻燃剂 (ABS、HIPS、 LDPE用)
六溴二苯醚	Hexabromodiphenyl ether; hexabromodiphenyloxiide	36483-60-0	$C_{12}H_4Br_6O$	阻燃剂
五溴二苯醚; PentaBDE	Pentabromodiphenyl ether; pentabromodiphenyloxiide; PentaBDE	32534-81-9	$C_{12}H_6Br_5O$	阻燃剂

### ●三丁基锡化合物(TBT)、三苯基锡化合物(TPT)

#### 1. 所属物质的例子

仅三丁基锡化合物和三苯基锡化合物属于此类，而二丁基锡化合物(DBT)和二苯基锡化合物(DPT)等则不属于此类。

另外，金属锡、锡合金、电镀锡、锡的无机化合物也不属于此类。

所属物质的例子如下所示。

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
三正丁基溴化锡	Tributyltin bromide	1461-23-0	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnBr	杀菌剂
三丁基氧化锡(TBTO); 双三丁基氧化锡	Tributyltin oxide; Bis(tributyltin)oxide; Distannoxane, hexabutyl-	56-35-9	C <sub>24</sub> H <sub>54</sub> O <sub>2</sub> Sn <sub>2</sub>	杀菌剂
三苯基锡	Triphenyltin	668-34-8	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn	杀菌剂
三苯基氯化锡; 氯化三苯基锡	Triphenyltin chloride; Fentin chloride; Stannane, chlorotriphenyl-	639-58-7	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnCl	杀菌剂
三苯基羟基锡; 三苯基氢氧化锡	Triphenyltin Hydroxide; Fentin hydroxide; Stannane, Bydroxytriphenyl-	76-87-9	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOH	杀菌剂
三苯基锡=N,N'-二甲基二硫代 氨基甲酸酯; 二甲基二硫代氨基 甲酸三苯基锡	Triphenyltin N,N' -dimethyldithiocarbamate; Stannane, [[(dimethylamino)thi omethyl]thio]triphenyl-	1803-12-9	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn(CH <sub>3</sub> ) <sub>2</sub> NCS <sub>2</sub>	
三苯基氟化锡	Triphenyltin fluoride; Fentin fluoride	379-52-2	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnF	
三苯基锡醋酸盐; 醋酸三苯基锡; 三苯基乙酸锡	Triphenyltin acetate; Fentin acetate; Stannane, (acetyloxy)triphenyl-	900-95-8	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>	
三苯基锡脂肪酸盐(仅限于脂肪 酸的碳原子数为9、10或11之 物)	Triphenyltin fatty acid salts	18380-71-7; 18380-72-8; 47672-31-1; 94850-90-5		

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
三苯基锡氯代乙酸盐; 三苯基锡 氯代醋酸盐	Triphenyltin chloroacetate; (chloroacetoxy) triphenylstannane	7094-94-2	$(C_6H_5)_3SnOCOCH_2Cl$	
三丁基甲基丙烯酸锡(TBTM)	Tributyltin methacrylate; Tributyl(methacryloyloxy) stannane; Stannane, Tributyl[(2-methyl- 1-oxo-2-propenyloxy)-	2155-70-6	$(C_4H_9)_3SnC_4H_5O_2$	
双(三丁基锡)富马酸盐	Bis(tributyltin) fumarate	6454-35-9; 24291-45-0	$C_2H_2(COO)_2$ $([C_4H_9]_3Sn)_2$	
三丁基氟化锡	Tributyltin fluoride	1983-10-4; 7304-48-5	$(C_4H_9)_3SnF$	
双(三丁基锡)2,3-二溴丁二酸 盐	Bis(tributyltin)2,3- dibromosuccinate	31732-71-5; 56323-17-2	$([C_4H_9]_3Sn)_2C_2H_2$ $(BR)_2(COO)_2$	
乙酸三丁基锡; 醋酸三丁基锡	Tributyltin acetate	56-36-0	$(C_4H_9)_3SnOCOCH_3$	
月桂酸三丁基锡; 三丁基((1- 氧代十二烷基)氧)锡	Tributyltin laurate; Tributyl(lauroyloxy)stannane	3090-36-6	$(C_4H_9)_3SnC_{12}H_{23}O_2$	
双(三丁基锡)苯二甲酸盐; 三丁基锡苯二甲酸盐	Bis(tributyltin)phthalate; [(Phthaloylbis(oxy)]bis(tri- butylstannane)	4782-29-0	$(C_6H_4)(COO)_2$ $([C_4H_9]_3Sn)_2$	
三丁基锡磺酸盐	Tributyltin sulfamate; Stannane, [(aminosulfonyl)oxy] tributyl-	6517-25-5	$(C_4H_9)_3SnSO_3NH_2$	
双(三丁基锡)马来酸盐	Bis(tributyltin) maleate	14275-57-1; 24291-45-0	$C_2H_5O_4Sn_2$	
三丁基氯化锡	Tributyltin chloride; Tributylchlorostannane; Stannane, tributylchloro-	1461-22-9; 7342-38-3	$(C_4H_9)_3SnCl$	

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
三丁基锡环烷酸锡和其异构体的混合物；萘酸三丁基锡；三丁基环烷酸锡(TBTN)	Mixture of tributyltin cyclopentanecarboxylate and its analogs; Stannane, tributyl-, mono (naphthenoxy)Derives. ; Tributyltin naphthenate	85409-17-2		
1, 2, 3, 4, 4a, 4b, 5, 6, 10, 10a-十氢-7-异丙基-1, 4a-二甲基-1-菲甲酸甲酯三丁基锡和其异构体的混合物；三丁基锡松香盐	Mixture of tributyltin 1, 2, 3, 4, 4a, 4b, 5, 6, 10, 10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-phenanthlene carboxylate and its analogs; Tributyltin rosin salt	26239-64-5	C <sub>32</sub> H <sub>56</sub> O <sub>2</sub> Sn	
丙烯酸辛酯, 甲基丙烯酸甲酯和甲基丙烯酸三丁基锡酯的共聚物(烷基=丙烯酸盐的碳原子数限定为8个);	Octyl acrylate-Methyl methacrylate-Tributyltin methacrylate copolymer (alkyl; C=8)	67772-01-4		

## ●石棉

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
石棉 (总称)	Asbestos	1332-21-4; 132207-32-0; 132207-33-1		绝缘体、填料
蓝石棉	Crocidolite	12001-28-4	$\text{Na}_2\text{Fe}_5(\text{Si}_8\text{O}_{22})(\text{OH})_2$	绝缘体、填料
温石棉	Chrysotile	12001-29-5	$\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$	绝缘体、填料
铁石棉	Amosite	12172-73-5	$(\text{Mg}, \text{Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	绝缘体、填料
直闪石	Anthophyllite	77536-67-5	$(\text{Mg}, \text{Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$	绝缘体、填料
透闪石	Tremolite	77536-68-6	$\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$	绝缘体、填料
阳起石	Actinolite	77536-66-4	$\text{Ca}_2(\text{Mg}, \text{Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$	绝缘体、填料

## ●甲醛

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
甲醛(单体); 福尔马林	Formaldehyde; formalin; formic aldehyde; formol	50-00-0	$\text{CH}_2\text{O}$	防腐剂、单体(如, 酚醛树脂和三聚氰胺树脂)

## ●聚氯乙烯 (PVC) 以及 PVC 混合物

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS号码	化学分子式	主要用途
PVC 和 PVC 混合物 ; 聚氯乙烯和聚氯乙烯混合物	PVC and PVC blends; polyvinyl chloride and polyvinyl chloride blends	e. g. 9002-86-2		聚氯乙烯树脂

## ●氧化铍

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
氧化铍	Beryllium oxide	e. g. 1304-56-9	$\text{BeO}$	散热片

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## ●氢氟碳化合物(HFC)、全氟化碳(PFC)

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
HFC-23; 三氟甲烷	HFC-23; Trifluoromethane	75-46-7	CHF <sub>3</sub>	制冷剂
HFC-32; 二氟甲烷	HFC-32; Difluoromethane	75-10-5	CH <sub>2</sub> F <sub>2</sub>	制冷剂
HFC-41; 氟代甲烷	HFC-41; Fluoromethane	593-53-3	CH <sub>3</sub> F	制冷剂
HFC-125; 五氟乙烷	HFC-125; Pentafluoroethane	354-33-6	C <sub>2</sub> HF <sub>5</sub>	制冷剂
HFC-134; 1,1,2,2-四氟乙烷	HFC-134; 1,1,2,2-tetrafluoroethane	359-35-3	CHF <sub>2</sub> CHF <sub>2</sub>	制冷剂
HFC-134a; 1,1,1,2-四氟乙烷	HFC-134a; 1,1,1,2-tetrafluoroethane	811-97-2	CH <sub>2</sub> FCF <sub>3</sub>	制冷剂
HFC-143; 1,1,2-三氟乙烷	HFC-143; 1,1,2-trifluoroethane	430-66-0	CHF <sub>2</sub> CH <sub>2</sub> F	制冷剂
HFC-143a; 1,1,1-三氟乙烷	HFC-143a; 1,1,1-trifluoroethane	420-46-2	CH <sub>3</sub> CF <sub>3</sub>	制冷剂
HFC-152a; 1,1-二氟乙烷	HFC-152a; 1,1-difluoroethane	75-37-6	CH <sub>3</sub> CHF <sub>2</sub>	制冷剂
HFC-227ea; 1,1,1,2,3,3,3-七氟丙烷	HFC-227ea; 1,1,1,2,3,3,3-heptafluoropropane	431-89-0	C <sub>3</sub> HF <sub>7</sub>	灭火剂
HFC-236fa; 1,1,1,3,3,3-六氟丙烷	HFC-236fa; 1,1,1,3,3,3-hexafluoropropane	690-39-1	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	灭火剂
HFC-245ca; 1,1,2,2,3-五氟丙烷	HFC-245ca; 1,1,2,2,3-pentafluoropropane	679-86-7	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	制冷剂
HFC-43-10mee; 1,1,1,2,3,4,4,5,5-十氟戊烷	HFC-43-10mee; 1,1,1,2,3,4,4,5,5-decafluoropentane	138495-42-8	C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>	溶剂
PFC-14; 四氟甲烷; 全氟甲烷	PFC-14; Perfluoromethane	75-73-0	CF <sub>4</sub>	干腐蚀
PFC-116; 六氟乙烷; 全氟乙烷	PFC-116; Perfluoroethane	76-16-4	C <sub>2</sub> F <sub>6</sub>	制冷剂
PFC-218; 八氟丙烷; 全氟丙烷	PFC-218; Perfluoropropane	76-19-7	C <sub>3</sub> F <sub>8</sub>	制冷剂
PFC-31-10; 十氟丁烷; 全氟丁烷	PFC-31-10; Perfluorobutane	355-25-9	C <sub>4</sub> F <sub>10</sub>	灭火剂
PFC-c318; 八氟环丁烷	PFC-c318; Perfluorocyclobutane	115-25-3	c-C <sub>4</sub> F <sub>8</sub>	干腐蚀
PFC-41-12; 十二氟戊烷; 全氟戊烷	PFC-41-12; Perfluoropentane	678-26-2	C <sub>5</sub> F <sub>12</sub>	溶剂
PFC-51-14; 十四氟己烷; 全氟己烷	PFC-51-14; Perfluorohexane	355-42-0	C <sub>6</sub> F <sub>14</sub>	制冷剂

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## ●全氟辛烷磺酸（及其盐）(PFOS)

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
PFOS; 全氟辛烷磺酸; 全氟辛基磺酸钾	PFOS; Perfluorooctane sulfonates	e. g. 2795-39-3	$C_8F_{17}SO_2X$ (X=羟基, 金属盐, 卤化物, 氨基, 及包括聚合物在内的其他衍生物。)	拒水剂、拒油剂

## ●特定苯并三氮唑

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
2-(3', 5'-二叔丁基-2'-羟基苯基)苯并三唑; 2-(2'-羟基-3', 5'-二叔丁基苯基)-苯并三唑	2-(3', 5'-Di-tert-butyl-2'-hydroxyphenyl)benzotriazole; 2-(2'-Hydroxy-3', 5'-di-tert-butylphenyl)benzotriazole	3846-71-7	$C_{20}H_{25}N_3O$	紫外线防护剂、紫外线吸收剂

## ●二氯化钴

## 1. 所属物质的例子

中文名称 (通称、简称、化学名称等)	英文名称	CAS 号码	化学分子式	主要用途
二氯化钴	Cobalt dichloride	7646-79-9	$CoCl_2$	干燥剂(硅胶等)的湿度指示剂

（注意事项）

有时可能在未公告的情况下，对索尼技术标准 SS-00259 零部件和材料中的环境管理物质 管理规定进行内容的修订或修改。

零部件和材料中的环境管理物质 管理规定

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