

【 NIDEC SANKYO Environmental Substances Control Standards 】

Revision 6. 0



1st enactment Des.22.2005

6th update Sep.25.2009

|   |       |
|---|-------|
| 1. Stance in environmental substance control      | 2/14  |
| 2. Substances prohibited in Products              | 3/14  |
| __RoHS substances                                 |       |
| 3. Substances prohibited in Products              | 4/14  |
| __Other Prohibited Substances                     |       |
| 4. Substances prohibited in Products              | 5/14  |
| __Halogen free Substances                         |       |
| 5. Substances restricted in Products              | 6/14  |
| 6. Substances prohibited in Manufacturing Process | 6/14  |
| 7. Details of Environmental Substances            | 7/14  |
| 8. Revision History List                          | 14/14 |

\*Japanese version is the official text.

**NIDEC SANKYO CORPORATION**

# 1. Stance in environmental substance control

Nidec Sankyo establish the following standards to manage the parts, raw materials, auxiliary materials, packaging materials used in the products as well as auxiliary materials used in manufacturing processes, which are subject to the Environmental Substances Control.

## 1) Selection criteria in environmental substances

- (1) Chemicals that are prohibited or restricted by Japanese laws and regulations, EU Laws or industry guidance (Note 1) because of their high probabilities in harmful effects to humans due to cumulative, insoluble or carcinogenic properties.

Notes 1) EU Laws: RoHS, ELV, EU2037(Montreal Protocol), 94/62/EC(packaging and packaging waste)

Japanese Laws: Pollutant Release and Transfer Register laws (PRTR), Kyoto Protocol  
Law Concerning the Examination and Regulation of Manufacture\_etc of  
Chemical Substances (Kashinhou)

Industry guidance: Japan Green Procurement Survey Standardization Initiative  
\_Joint Industry Guide)

- (2) Substances regulated by Green Procurement standards of companies, or substances which we need to regulate.

We take priority on external demands such as from customers and add the substances individually when our standards cannot satisfy them.

## 2) Regulation classifications and definitions of environmental substances

- (1) Prohibition : Substances whose use has been prohibited immediately.

① Substances prohibited in products\_\_RoHS substances

: Substances specified by EU\_RoHS

② Substances prohibited in products\_\_Other prohibited substances

: Substances restricted by EU Laws, Japanese Laws or industry guidance.

③ Substances prohibited in products\_\_Halogen free substances

: Substances restricted in certain industries

④ Substances in manufacturing processes

: Substances restricted by EU Laws, Japanese Law or industry guidance

- (2) Restriction : Substances whose inclusion in products are planned for reduction and monitored until finally eliminated.

① Substances restricted in products: Substances restricted by Japanese Laws or industry guidance

## 3) Units to measure the content ratio of environmental substances

- (1) Measure the weight ratio of each homogeneous material (Note 1) in parts composed of multiple materials.

If a part cannot be separated into homogeneous materials mechanically, use the separable minimum unit to calculate the weight ratio.

Note 1) Homogeneous material\_\_Minimum unit of material with no bias in element and density

- (2) Examples of unit of measure

① Electrical cable: Insulation, printing ink on insulation, core wire and & plating on the core wire

② Electrolytic capacitor: Terminals, separator, electrolytic solution, tape to fasten element & others

③ Plated steel plate: Base material, surface plating(plating, chromate treatment, coating and other)

## 2. Substances prohibited in Products\_\_RoHS substances

### 1) Substance List

| No                 | Substance Name   | CAS No   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|--------------------|--|--|--------------|-----------------------------|--|--|--|--|-----------|----------|-------|--------------|----------------|--|-------|--|--------|---------|------|--|--|--|--|
|                    | Restriction condition, threshold value   | usages/materials for restriction                                 |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    |  | Main laws  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 1                  | Cadmium and Cadmium compounds  | 7440-43-9 etc.   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | Resin(notes):intentional content prohibition, or impurities content < 5ppm<br>Other materials :intentional content prohibition, or impurities content <75ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | <Exemptions> Glass material of optic/filter<br>Cadmium plating except for methods prohibited by 91/338/EEC   |  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 2                  | Lead and Lead compounds  | 7439-92-1 etc.   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | Resin(notes):intentional content prohibition, or impurities content <100ppm<br>Solder :intentional content prohibition, or impurities content <500ppm<br>Solder in flow/dip tank, Solder used to connect PWB, parts, etc<br>: impurities content <800ppm<br>Other materials :intentional content prohibition, or impurities content <1000ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | <Exemptions> The following list of exceptions and the usage specified by RoHS_appendix   |  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | <table border="1"> <thead> <tr> <th>Usage/<br/>material</th> <th colspan="3">Alloy</th> <th>electronic<br/>Ceramic parts</th> <th>Glass material of optic/filter<br/>fluorescent tube, electronic component</th> <th>High melting point tin<br/>/lead solder</th> </tr> <tr> <th>allowance</th> <th>Aluminum</th> <th>steel</th> <th>Copper alloy</th> <th colspan="2">No restriction</th> <th>&gt; 85%</th> </tr> </thead> <tbody> <tr> <td></td> <td>&lt; 0.4%</td> <td>&lt; 0.35%</td> <td>&lt; 4%</td> <td colspan="2"></td> <td></td> </tr> </tbody> </table> | Usage/<br>material   | Alloy        |                             |  | electronic<br>Ceramic parts            | Glass material of optic/filter<br>fluorescent tube, electronic component | High melting point tin<br>/lead solder | allowance | Aluminum | steel | Copper alloy | No restriction |  | > 85% |  | < 0.4% | < 0.35% | < 4% |  |  |  |  |
| Usage/<br>material | Alloy  |  |              | electronic<br>Ceramic parts | Glass material of optic/filter<br>fluorescent tube, electronic component | High melting point tin<br>/lead solder |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| allowance          | Aluminum   | steel  | Copper alloy | No restriction              |  | > 85%                                  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | < 0.4%   | < 0.35%  | < 4%         |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 3                  | mercury and mercury compounds  | 7439-97-6 etc.   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | All materials : intentional content prohibition、or impurities content <1000ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | <Exemptions> Mercury in compact fluorescent lamp of less than 5mg/pc, and mercury in straight fluorescent lamp, lamp   |  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 4                  | Hexavalent chromium compounds  | 7789-00-6 etc.   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | All materials : intentional content prohibition、or impurities content <1000ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | <Exemptions> Hexavalent chromium as anti-corrosion of the carbon steel used in the cooling system of absorpion refrigerators.  |  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| ※                  | Heavy metal 4 substances (Cd, Pb, Hg, Cr6) contained in packaging material   | —  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | Heavy metal Four substances total value < 100ppm<br>(Whether intended inclusion or impurities)   | Packaging materials for products specified by customer standards |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    |  | 94/62/EC   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 5                  | Polybrominated biphenyls (PBB)   | 67774-32-7 etc.  |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | All materials : intentional content prohibition、or impurities content <1000ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    |  | RoHS   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
| 6                  | Polybrominated diphenyl Ether (PBDE)   | 1163-19-5 etc.   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    | All materials : intentional content prohibition、or impurities content <1000ppm   | All usages、All materials   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |
|                    |  | RoHS   |              |                             |  |  |  |  |           |          |       |              |                |  |       |  |        |         |      |  |  |  |  |

Notes) Definition of resin\_\_ High polymer based fiber, film, adhesive tape, molded products, synthetic rubber, adhesives, plant material plastics & coatings, ink.

### 2) Analysis method of Cadmium, Lead and Mercury

Analysis method should be used that ensures quantitative lower limit of Cadmium is <5 ppm, Lead <30 ppm.

#### (1) Pretreatment of Analysis sample

##### Cadmium(Cd)

- Ashing in the presence of sulfuric acid.(e.g. IEC62321:2008)
- Pressurized acid digestion in sealed vessel. [ Microwave assisted acid digestion. (e.g. EN13346:2000, EPA3052:1996,IEC62321:2008)]
- Acid digestion with nitric acid, hydrogen peroxide or hydrochloric acid. (e.g. EPA 3050B Rev. 2:1996)
- Wet digestion with sulfuric acid, nitric acid or hydrogen peroxide. (e.g. BS EN 1122:2001) etc

##### Lead(Pb)

- Ashing in the presence of sulfuric acid.(e.g. IEC62321:2008)
- Pressurized acid digestion in sealed vessel. [ Microwave assisted acid digestion. (e.g. EN13346:2000, EPA3052:1996, IEC62321:2008)]
- Acid digestion with nitric acid, hydrogen peroxide or hydrochloric acid. (e.g. EPA 3050B Rev. 2:1996)
- Wet digestion with nitric acid or hydrogen peroxide. etc

##### Mercury(Hg)

- A heating evaporation-cold-vapor mercury-atomic-absorption method(e.g. IEC62321:2008)
- Wet digestion in which a decomposition flask with a reflux condenser is used to decompose mercury by sulfuric acid or nitric acid.(Kjeldahl method) etc

If one of the above digestion gives any precipitant, solubilize completely with another method. (e.g. alkaline digestion)

#### (2) Recommended analysis method

- Inductively Coupled Plasma-Atomic Emission Spectrometer (ICP-AES), Inductively Coupled Plasma-Mass Spectrometer (ICP-MS) (e.g. IEC62321:2008)
- Atomic Absorption Spectrometer (AAS)

### 3) Analysis method of Hexavalent Chromium

#### (1) Pretreatment of Analysis sample

- Hot water extraction method
- extraction method etc

#### (2) Recommended Analysis method

- Diphenylcarbazide absorptiometric method

### 4) Analysis method of PBB/PBDE

#### (1) Pretreatment of Analysis sample

- After crush the test piece, extract PBB/PBDE by Soxhlet extraction method using appropriate organic solvent etc

#### (2) Recommended Analysis method

- Gas chromatography-mass spectrometry(GC/MS)

### 5) Update of precise analytical data of substance designated by RoHS

(1) In case of material changes, material maker changes, process modifications or uncertainty of materials included, obtain the latest and accurate analysis data from the suppliers or makers.

(2) At the request of outside sources like customers obtain the latest data from the supplier or maker for each specified year.

### 3. Substances prohibited in Products\_\_Other Prohibited Substances

#### 1) Substance List

| No | Substance Name  |   | CAS No          |
|----|---|---|-----------------|
|    | Restriction condition, threshold value  | usages/materials for restriction                    | Main laws       |
| 1  | Polychlorinated biphenyls (PCB)   |   | 1336-36-3 etc   |
|    | All materials : intentional content prohibited  | All usages、All materials                            | PRTR, Kashinhou |
| 2  | Polychlorinated triphenyl (PCT)   |   | 61788-33-8 etc. |
|    | All materials : intentional content prohibited  | All usages、All materials                            | —               |
| 3  | Polychlorinated naphthalenes (PCN)  |   | 1321-65-9 etc.  |
|    | All materials : intentional content prohibited  | All usages、All materials                            | Kashinhou       |
| 4  | Chlorinated paraffins (CP)  |   | 85535-84-8 etc. |
|    | All materials : intentional content prohibited  | All usages、All materials                            | —               |
| 5  | Organotin compounds (TBT, TPT etc.)   |   | 1461-23-0 etc.  |
|    | All materials : intentional content prohibited  | All usages、All materials                            | PRTR            |
| 6  | Bis (tributyltin) oxide (TBTO)  |   | 56-35-9         |
|    | All materials : intentional content prohibited  | All usages、All materials                            | PRTR, Kashinhou |
| 7  | Asbestos  |   | 1332-21-4 etc.  |
|    | All materials : intentional content prohibited  | All usages、All materials                            | PRTR            |
| 8  | Specific Azo compounds *Azo dyes and pigments that compose specific amines  |   | 92-67-1 etc.    |
|    | All materials : intentional content prohibited  | Materials that come in contact to skin continuously | —               |
| 9  | Formaldehyde (Formalin)   |   | 50-00-0         |
|    | Aerial concentration: Less than 0.1ppm (chemG)<br>Aerial concentration : Less than 0.15mg/m3(Formalin act)  | All usages、All materials                            | PRTR            |
| 10 | Polyvinyl chloride (PVC)  |   | 9002-86-2       |
|    | All materials : intentional content prohibited  | material of product specified by customer standard  | —               |
|    | <Exemptions> The prohibition period should be based on customer request.  |   |                 |
| 11 | Radioactive elements  |   | 7440-46-2 etc.  |
|    | All materials : intentional content prohibited  | All usages、All materials                            | —               |
| 12 | Perfluorooctane sulfonates (PFOS)   |   | 1763-23-1 etc.  |
|    | All materials : intentional content prohibited  | All usages、All materials                            | —               |
|    | <Exemptions> Photoresist for photolithography processes or reflection-prevention coating materials<br>Photo-coating materials for printing originals on film or paper |   |                 |
| 13 | Specified benzotriazole 2-(2H-1,2,3-benzotriazole-2-yl)-4,6-di-tert-butylphenol   |   | 3846-71-7       |
|    | All materials : intentional content prohibited  | All usages、All materials                            | Kashinhou       |
| 14 | Beryllium oxide   |   | 1304-56-9       |
|    | All materials : intentional content prohibited  | All usages、All materials                            | PRTR            |
| 15 | Hydrofluorocarbon (HFC)   |   | 354-33-6 etc.   |
|    | All materials : intentional content prohibited  | All usages、All materials                            | Kyoto Protocol  |
| 16 | Perfluorocarbon (PFC)   |   | 375-72-4 etc.   |
|    | All materials : intentional content prohibited  | All usages、All materials                            | Kyoto Protocol  |
| 17 | Ozone Depleting Substances (CFCs, HCFCs, HBFCs etc)   |   | —               |
|    | All materials : intentional content prohibited  | All usages、All materials                            | EU2037          |
| 18 | Dimethyl Fumarate (DMF)   |   | 624-49-7        |
|    | All materials : intentional content prohibited  | All usages、All materials                            | -               |

(1)Analyze formaldehyde based on 'JIS A1901' \_ small chamber method.

(2)The chemical analyses of other prohibited substances are unnecessary and to be confirmed by the element composition table or MSDS of the material.

At the request of outside sources like customers obtain chemical analyses from the supplier or maker.

#### 4. Substances prohibited in Products\_\_Halogen free Substances

1) Range of restriction object : Product of Personal Computer and equipment related to Personal Computer and Lens Actuator in a cellular phone.

\*Packaging materials are off the subject.

2) Materials for restriction : All materials except metal, glass, and ceramic

\*Restricted materials also include the resin materials used for surface treatment for metal and ceramic surface and the solders

3) Substance List

| No | Substance Name                | Restriction condition, threshold value | usages/materials for restriction | CAS No            |
|----|-------------------------------|--|----------------------------------|-------------------|
|    |                               |  |                                  | Main laws         |
| 1  | Chlorine (Cl element)         | All materials <630ppm                  | based on Mark 1) 2)              | 7782-50-5<br>—    |
| 2  | Bromine (Br element)          | All materials <630ppm                  | based on Mark 1) 2)              | 7726-95-6<br>—    |
| ※  | Total of Chlorine and Bromine | All materials <1000ppm                 | based on Mark 1) 2)              | —<br>—            |
| 3  | Antimony trioxide             | All materials <1000ppm                 | based on Mark 1) 2)              | 1309-64-4<br>PRTR |
| 4  | Red phosphorus                | All materials <1000ppm                 | based on Mark 1) 2)              | 7723-14-0<br>—    |

4) Analysis method of Halogen free Substances

(1) Chlorine, Bromine

• Analyze based on EN14582\_\_Ion exchange chromatography using a combustion chamber.

(2) Antimony trioxide, Red phosphorus

• The chemical analyses of Halogen free substances are unnecessary and to be confirmed by the element composition table or MSDS of the material.

• At the request of outside sources like customers obtain chemical analyses from the supplier or maker.

## 5. Substances restricted in Products

### 1) Substances List

| No | Substance Name   | CAS No.        | Main laws | Main usages  |
|----|--|----------------|-----------|--|
| 1  | Other organochlorine compounds                             | —              | —         | Flame retardants of resin etc.                           |
| 2  | Other organobromine compounds                              | —              | —         | Flame retardants of resin etc.                           |
| 3  | Nickel and Nickel compounds                                | 7440-02-0 etc. | PRTR      | Pigments, Optical film material etc.                     |
| 4  | Arsenic and Arsenic compounds                              | 7440-38-2 etc. | PRTR      | Bleaching of glass, Dyes etc.                            |
| 5  | Perfluorooctanoic acid (PFOA)                              | 335-67-1 etc.  | —         | Supplementary agent of fluorine polymerization body etc. |
| 6  | Antimony and Antimony compounds (except Antimony trioxide) | 7440-36-0 etc. | PRTR      | Dyes, pigments, flame retardants etc.                    |
| 7  | Selenium and Selenium compounds                            | 7782-49-2 etc. | PRTR      | Exposure body, Paints, Catalyst etc.                     |
| 8  | Beryllium and Beryllium compounds (except Beryllium oxide) | 7440-41-7 etc. | PRTR      | Raw material of ceramic, J240Catalyst etc.               |
| 9  | Phthalate ester  | 131-11-3 etc.  | —         | Plasticizer, Dyes, pigments etc.                         |
| 10 | Bismuth and Bismuth compounds                              | 7440-69-9 etc. | —         | Solder material etc.                                     |

### 2) Analysis method of Substances restricted in Products

- (1)The chemical analyses of substances restricted in products are unnecessary and to be confirmed by the element composition table or MSDS of the material.
- (2)At the request of outside sources like customers obtain chemical analyses from the supplier or maker.

## 6. Substances prohibited in Manufacturing Process

### 1) Substances List

| No | Substance Name                            | CAS No.        | Main laws               | Content of restriction                                       |
|----|---|----------------|-------------------------|--|
| 1  | CFCs (Specific)                           | 75-69-4 etc.   | EU2037                  | In-house process<br>:Don't use by the manufacturing process. |
| 2  | Methyl bromide                            | 74-83-9        | PRTR, EU2037            |  |
| 3  | 1,1,1-Trichloroethane                     | 71-55-6        | PRTR, EU2037            |  |
| 4  | Carbon tetrachloride (Tetrachloromethane) | 56-23-5        | PRTR, Kashinhou, EU2037 |  |
| 5  | 1,2-Dichloroethane                        | 107-06-2       | PRTR                    |  |
| 6  | 1,2-Dichloroethylene                      | 156-59-2       | PRTR                    |  |
| 7  | Trichloroethylene                         | 79-01-6        | PRTR, Kashinhou         |  |
| 8  | Dichloromethane (Methylene chloride)      | 75-09-2        | PRTR                    |  |
| 9  | Tetrachloroethylene                       | 127-18-4       | PRTR, Kashinhou         |  |
| 10 | HCFCs (CFC Alternatives)                  | 75-45-6 etc.   | EU2037                  |  |
| 11 | Halon-1211, 1301, 2402                    | 353-59-3       | PRTR, EU2037            |  |
| 12 | Chloroform (Trichloromethane)             | 67-66-3        | PRTR                    |  |
| 13 | 1,1-Dichloroethylene                      | 75-35-4        | PRTR                    |  |
| 14 | 1,1,2-Trichloroethane                     | 79-00-5        | PRTR                    |  |
| 15 | HBFCs (Bromodifluoromethane etc.)         | 1511-62-2 etc. | EU2037                  |  |
| 16 | Bromochloromethane                        | 74-97-5        | EU2037                  |  |

### 2) Analysis method of substances prohibited to use

- (1)The chemical analyses of substances restricted in products are unnecessary and to be confirmed by the element composition table or MSDS of the material.
- (2)At the request of outside sources like customers obtain chemical analyses from the supplier or maker.

## 7. Details of Environmental Substances

### 1) Substances prohibited in Products\_\_RoHS substances

| Substance  | Chemical formula  | CAS No.    | Metal conversion factor |
|--|---|------------|-------------------------|
| <b>(1) Cadmium and Cadmium compounds</b>   |   |            |                         |
| *All substances containing cadmium or cadmium compounds come under prohibited substances |   |            |                         |
| Cadmium  | Cd  | 7440-43-9  | 1.000                   |
| Cadmium oxide  | CdO   | 1306-19-0  | 0.875                   |
| Cadmium sulfide  | CdS   | 1306-23-6  | 0.778                   |
| Cadmium chloride   | CdCl <sub>2</sub>   | 10108-64-2 | 0.613                   |
| Cadmium sulfate  | CdSO <sub>4</sub>   | 10124-36-4 | 0.539                   |
| Cadmium Nitrate  | Cd(NO <sub>3</sub> ) <sub>2</sub>                         | 10325-94-7 | 0.475                   |
| Cadmium carbonate  | CdCO <sub>3</sub>   | 513-78-0   | 0.652                   |
| Cadmium Selenide   | CdSe  | 1306-24-7  | 0.587                   |
| Cadmium Telluride  | CdTe  | 1306-25-8  | 0.468                   |
| Cadmium Hydroxide  | Cd(OH) <sub>2</sub>                                       | 21041-95-2 | 0.768                   |
| Cadmium Stearate   | Cd(C <sub>17</sub> H <sub>35</sub> COO) <sub>2</sub>      | 2223-93-0  | 0.165                   |
| Other Cadmium compounds  | -   | -          | -                       |
| <b>(2) Lead and Lead compounds</b>   |   |            |                         |
| *All substances containing lead or lead compounds come under prohibited substances       |   |            |                         |
| Lead   | Pb  | 7439-92-1  | 1.000                   |
| Lead(II) carbonate   | PbCO <sub>3</sub>   | 598-63-0   | 0.775                   |
| Lead(IV) oxide   | PbO <sub>2</sub>  | 1309-60-0  | 0.866                   |
| Lead(II,IV) oxide  | Pb <sub>3</sub> O <sub>4</sub>                            | 1314-41-6  | 0.907                   |
| Lead(II) sulfide   | PbS   | 1314-87-0  | 0.866                   |
| Lead(II) oxide   | PbO   | 1317-36-8  | 0.928                   |
| Lead(II) carbonate basic   | 2PbCO <sub>3</sub> ·Pb(OH) <sub>2</sub>                   | 1319-46-6  | 0.801                   |
| Lead hydroxidcarbonate   | 2PbCO <sub>3</sub> ·Pb(OH) <sub>2</sub>                   | 1344-36-1  | 0.801                   |
| Lead(II) sulfate   | PbSO <sub>4</sub>   | 7446-14-2  | 0.683                   |
| Lead(II) phosphate   | Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>           | 7446-27-7  | 0.766                   |
| Lead(II) chromate  | PbCrO <sub>4</sub>  | 7758-97-6  | 0.641                   |
| Lead(II) titanate  | PbTiO <sub>3</sub>  | 12060-00-3 | 0.686                   |
| Lead sulfate, sulphuric acid, lead salt  | PbXSO <sub>4</sub>  | 15739-80-7 | 1.000                   |
| Lead sulphate,tribasic   | Pb <sub>4</sub> O <sub>3</sub> (SO <sub>4</sub> )         | 12202-17-4 | 0.852                   |
| Lead stearate  | Pb(C <sub>17</sub> H <sub>35</sub> COO) <sub>2</sub>      | 1072-35-1  | 0.268                   |
| Lead stearate,dibasic  | 2PbO·Pb(C <sub>17</sub> H <sub>35</sub> COO) <sub>2</sub> | 56189-09-4 | 0.410                   |
| Lead acetate   | Pb(CH <sub>3</sub> COO) <sub>2</sub>                      | 301-04-2   | 0.637                   |
| Lead zcetate( II ),trihydrate  | Pb(CH <sub>3</sub> COO) <sub>2</sub>                      | 6080-56-4  | 0.546                   |
| Lead selenide  | PbSe  | 12069-00-0 | 0.724                   |
| Lead( II ) zirconate   | PbZrO <sub>3</sub>  | 12060-01-4 | 0.598                   |
| Lead Hydroxide   | Pb(OH) <sub>2</sub>                                       | 1311-11-1  | 0.859                   |
| Lead( II ) nitrate   | Pb(NO <sub>3</sub> ) <sub>2</sub>                         | 10099-74-8 | 0.626                   |
| Other Lead compounds   | -   | -          | -                       |
| <b>(3) Mercury and Mercury compounds</b>   |   |            |                         |
| *All substances containing mercury or mercury compounds come under prohibited substances |   |            |                         |
| Mercury  | Hg  | 7439-97-6  | 1.000                   |
| Mercury(II) chloride   | HgCl <sub>2</sub>   | 7487-94-7  | 0.739                   |
| Mercury(II) oxide  | HgO   | 21908-53-2 | 0.926                   |
| Mercuric sulfate   | HgSO <sub>4</sub>   | 7783-35-9  | 0.676                   |
| Mercuric nitrate   | Hg(NO <sub>3</sub> ) <sub>2</sub>                         | 10045-94-0 | 0.681                   |
| Mercuric sulfide   | HgS   | 1344-48-5  | 0.862                   |
| Mercurous oxide  | Hg <sub>2</sub> O   | 15829-53-5 | 0.962                   |
| Dimethyl mercury   | (CH <sub>3</sub> ) <sub>2</sub> Hg                        | 593-74-8   | 0.870                   |
| Mercury chloride   | Hg <sub>2</sub> Cl <sub>2</sub>                           | 10112-91-1 | 0.850                   |
| Other Mercury compounds  | -   | -          | -                       |

| Substance   | Chemical formula   | CAS No.    | Metal conversion factor |
|---|--|------------|-------------------------|
| <b>(4) Chromium (VI) compounds</b>  |  |            |                         |
| *Only substances containing hexavalent chromium compounds come under prohibited substances<br>Chromium metals, chromium alloys, chromium plating leaving no hexavalent chromium residue on plated surfaces, and trivalent chromium compounds do not come under this category. |  |            |                         |
| Sodium dichromate   | Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>   | 10588-01-9 | 0.397                   |
| Chromium(VI) oxide  | CrO <sub>3</sub>   | 1333-82-0  | 0.520                   |
| Calcium chromate  | CaCrO <sub>4</sub>   | 13765-19-0 | 0.333                   |
| Lead(II) chromate   | PbCrO <sub>4</sub>   | 7758-97-6  | 0.161                   |
| Potassium dichromate  | K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>  | 7778-50-9  | 0.353                   |
| Potassium chromate  | K <sub>2</sub> CrO <sub>4</sub>  | 7789-00-6  | 0.268                   |
| Barium chromate   | BaCrO <sub>4</sub>   | 10294-40-3 | 0.205                   |
| Sodium chromate   | Na <sub>2</sub> CrO <sub>4</sub>   | 7775-11-3  | 0.321                   |
| Strontium chromate  | SrCrO <sub>4</sub>   | 7789-06-2  | 0.255                   |
| Zinc chromate   | ZnCrO <sub>4</sub>   | 13530-65-9 | 0.287                   |
| Basic lead chromate   | Pb <sub>2</sub> CrO <sub>5</sub>   | 1344-38-3  | 0.095                   |
| Dichromic acid  | H <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>  | 13530-68-2 | 0.477                   |
| Copper chromite   | CuCrO <sub>4</sub>   | 12053-18-8 | 0.290                   |
| Other Chromium(VI) compounds  | -  | -          | -                       |
| <b>(5) Polybrominated biphenyls (PBB), Polybromodiphenyl ether (PBDE)</b>   |  |            |                         |
| *All substances 1~10BB, 1~10BDE come under prohibited substances  |  |            |                         |
| Bromobiphenyl and ethers  | C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> Br                               | 2113-57-7  | -                       |
|   | C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> Br                               | 92-66-0    | -                       |
|   | C <sub>6</sub> H <sub>5</sub> C <sub>6</sub> H <sub>4</sub> Br                               | 101-55-3   | -                       |
|   | Br(C <sub>6</sub> H <sub>4</sub> )O(C <sub>6</sub> H <sub>5</sub> )                          | 2052-07-5  | -                       |
| Decabromobiphenyl and ethers  | C <sub>6</sub> Br <sub>5</sub> C <sub>6</sub> Br <sub>5</sub>                                | 13654-09-6 | -                       |
|   | Br <sub>5</sub> C <sub>6</sub> OC <sub>6</sub> Br <sub>5</sub>                               | 1163-19-5  | -                       |
| Dibromobiphenyl and ethers C <sub>6</sub> H <sub>4</sub> BrC <sub>6</sub> H <sub>4</sub> Br   | C <sub>6</sub> H <sub>4</sub> BrC <sub>6</sub> H <sub>4</sub> Br                             | 92-86-4    | -                       |
|   | -  | 2050-47-7  | -                       |
| Heptabromobiphenyl and ethers   | -  | 68928-80-3 | -                       |
| Hexabromobiphenyl and ethers  | C <sub>6</sub> H <sub>2</sub> Br <sub>3</sub> C <sub>6</sub> H <sub>2</sub> Br <sub>3</sub>  | 59080-40-9 | -                       |
|   | C <sub>6</sub> H <sub>2</sub> Br <sub>3</sub> C <sub>6</sub> H <sub>2</sub> Br <sub>3</sub>  | 36355-01-8 | -                       |
|   | C <sub>12</sub> H <sub>4</sub> Br <sub>6</sub>   | 67774-32-7 | -                       |
|   | Br <sub>3</sub> C <sub>6</sub> H <sub>2</sub> OC <sub>6</sub> H <sub>2</sub> Br <sub>3</sub> | 36483-60-0 | -                       |
| Nonabromobiphenyl and ethers  | -  | 63936-56-1 | -                       |
| Octabromobiphenyl and ethers  | C <sub>6</sub> HBr <sub>4</sub> C <sub>6</sub> HBr <sub>4</sub>                              | 61288-13-9 | -                       |
|   | Br <sub>4</sub> C <sub>6</sub> HOC <sub>6</sub> HBr <sub>4</sub>                             | 32536-52-0 | -                       |
| Pentabromobiphenyl and ethers   | -  | 32534-81-9 | -                       |
| Polybrominated Biphenyls  | (C <sub>6</sub> -C <sub>6</sub> )H <sub>x</sub> Br <sub>y</sub>                              | 59536-65-1 | -                       |
| Tetrabromobiphenyl and ethers   | C <sub>12</sub> H <sub>6</sub> Br <sub>4</sub>   | 40088-45-7 | -                       |
|   | -  | 40088-47-9 | -                       |
| Tribromobiphenyl and ethers   | -  | 49690-94-0 | -                       |
| Polybrominated diphenyl ethers  | C <sub>12</sub> H <sub>x</sub> Br <sub>(10-x)</sub> O  | -          | -                       |

2) Substances prohibited in Products\_\_ Other Prohibited substances

| Substance  | Chemical formula   | CAS No.    | Metal conversion factor |
|--|--|------------|-------------------------|
| <b>(1) Polychlorinated biphenyls(PCB)、Polychlorinated triphenyls(PCT)</b>  |  |            |                         |
| Polychlorinated biphenyls  | Unspecified  | 1336-36-3  | -                       |
| Polychlorinated terphenyls   | Unspecified  | 61788-33-8 | -                       |
| Arocrol  | (C <sub>6</sub> -C <sub>6</sub> )H <sub>x</sub> Cl <sub>y</sub>  | 12767-79-2 | -                       |
| Chlorodiphenyl(Arocrol 1260)   | -  | 11096-82-5 | -                       |
| Kanechlor 500  | -  | 27323-18-8 | -                       |
| Arocrol 1254   | -  | 11097-69-1 | -                       |
| Terphenils   | C <sub>6</sub> H <sub>4</sub> (C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub>  | 26140-60-3 | -                       |
| <b>(2) Polychlorinated Naphthalenes(PNC)</b>   |  |            |                         |
| Polychlorinated Naphthalenes(Cl≥3)   | Unspecified  | 70776-03-3 | -                       |
| Trichloronaphthalene   | C <sub>10</sub> H <sub>5</sub> Cl <sub>3</sub>   | 1321-65-9  | -                       |
| Tetrachloronaphthalene   | C <sub>10</sub> H <sub>4</sub> Cl <sub>4</sub>   | 1335-88-2  | -                       |
| Pentachloronaphthalene   | C <sub>10</sub> H <sub>3</sub> Cl <sub>5</sub>   | 1321-64-8  | -                       |
| <b>(3) Short Chain Chlorinated Paraffins(CP)</b>   |  |            |                         |
| Chlorinated paraffine (C10-13)   | Unspecified  | 85535-84-8 | -                       |
| Other Short Chain Chlorinated Paraffins  | -  | -          | -                       |
| <b>(4) Organic tin compounds(TBT、TPT)</b>  |  |            |                         |
| *Only substances containing organic tin compounds come under prohibited substances<br>Metal tin, tin alloys, tin plating, and inorganic Tin compounds do not come under this category. |  |            |                         |
| Triphenyltin-N,N'-dimethyldithiocarbamate  | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn(CH <sub>3</sub> ) <sub>2</sub> NCS <sub>2</sub>                                   | 1803-12-9  | -                       |
| Triphenyltin fluoride  | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnF  | 379-52-2   | -                       |
| Triphenyltin acetate   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>   | 900-95-8   | -                       |
| Triphenyltin chloride  | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnCl   | 639-58-7   | -                       |
| Triphenyltin hydroxide   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOH   | 76-87-9    | -                       |
| Triphenyltin fatty acid salts (C=9-11)   | -  | 47672-31-1 | -                       |
| Triphenyltin chloroacetate   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>2</sub> Cl  | 7094-94-2  | -                       |
| Tributyltin methacrylate   | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>4</sub> H <sub>5</sub> O <sub>2</sub>                                       | 2155-70-6  | -                       |
| Bis(tributyltin) fumarate  | C <sub>2</sub> H <sub>2</sub> (COO) <sub>2</sub> ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub>                   | 6454-35-9  | -                       |
| Tributyltin fluoride   | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnF  | 1983-10-4  | -                       |
| Bis(tributyltin) 2,3-dibromosuccinate  | ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub> C <sub>2</sub> H <sub>2</sub> (Br) <sub>2</sub> (COO) <sub>2</sub> | 31732-71-5 | -                       |
| Tributyltin acetate  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>   | 56-36-0    | -                       |
| Tributyltin laurate  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>12</sub> H <sub>23</sub> O <sub>2</sub>                                     | 3090-36-6  | -                       |
| Bis(tributyltin) phthalate   | (C <sub>6</sub> H <sub>4</sub> )(COO) <sub>2</sub> ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub>                 | 4782-29-0  | -                       |
| Other Triphenyltin   | -  | -          | -                       |
| Other Tributyltin  | -  | -          | -                       |
| <b>(5) Asbestos</b>  |  |            |                         |
| Actinolite   | Unspecified  | 77536-66-4 | -                       |
| Amosite  | Unspecified  | 12172-73-5 | -                       |
| Anthophyllite  | Unspecified  | 77536-67-5 | -                       |
| Chrysotile   | Unspecified  | 12001-29-5 | -                       |
| Crocidolite  | Unspecified  | 12001-28-4 | -                       |
| Tremolite  | Unspecified  | 77536-68-6 | -                       |
| Other asbestos   | -  | -          | -                       |

| Substance   | Chemical formula   | CAS No.    | Metal conversion factor |
|---|--|------------|-------------------------|
| <b>(6) Specific Azo compounds</b>   |  |            |                         |
| *Azo compounds are used for various industrial dye, acid dyes, basic dyes, direct dyes, and fixative dyes and form specific amine under this category |  |            |                         |
| 4-aminoazobenzene   | C <sub>12</sub> H <sub>11</sub> N <sub>3</sub>                 | 60-09-3    | -                       |
| o-anisidine   | C <sub>7</sub> H <sub>9</sub> NO                               | 90-04-0    | -                       |
| 2-naphthylamine   | C <sub>10</sub> H <sub>9</sub> N                               | 91-59-8    | -                       |
| 3,3'-dichlorobenzidine  | C <sub>12</sub> H <sub>10</sub> Cl <sub>2</sub> N <sub>2</sub> | 91-94-1    | -                       |
| Biphenyl-4-ylamine  | C <sub>12</sub> H <sub>11</sub> N                              | 92-67-1    | -                       |
| Benzidine   | C <sub>12</sub> H <sub>12</sub> N <sub>2</sub>                 | 92-87-5    | -                       |
| o-toluidine   | C <sub>7</sub> H <sub>9</sub> N                                | 95-53-4    | -                       |
| 4-chloro-o-toluidine  | C <sub>7</sub> H <sub>8</sub> ClN                              | 95-69-2    | -                       |
| 2,4-toluenediamine  | C <sub>7</sub> H <sub>10</sub> N <sub>2</sub>                  | 95-80-7    | -                       |
| o-aminoazotoluene   | C <sub>14</sub> H <sub>15</sub> N <sub>3</sub>                 | 97-56-3    | -                       |
| 5-nitro-o-toluidine   | C <sub>7</sub> H <sub>8</sub> N <sub>2</sub> O <sub>2</sub>    | 99-55-8    | -                       |
| 3,3'-dichloro-4,4'-diaminodiphenylmethane   | C <sub>13</sub> H <sub>12</sub> Cl <sub>2</sub> N <sub>2</sub> | 101-14-4   | -                       |
| 4,4'-methylenedianiline   | C <sub>13</sub> H <sub>14</sub> N <sub>2</sub>                 | 101-77-9   | -                       |
| 4,4'-diaminodiphenylether   | C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> O               | 101-80-4   | -                       |
| p-chloroaniline   | C <sub>6</sub> H <sub>6</sub> ClN                              | 106-47-8   | -                       |
| 3,3'-dimethoxybenzidine   | C <sub>14</sub> H <sub>16</sub> N <sub>2</sub> O <sub>2</sub>  | 119-90-4   | -                       |
| 3,3'-dimethylbenzidine  | C <sub>14</sub> H <sub>16</sub> N <sub>2</sub>                 | 119-93-7   | -                       |
| 2-methoxy-5-methylaniline   | C <sub>8</sub> H <sub>11</sub> NO                              | 120-71-8   | -                       |
| 2,4,5-trimethylaniline  | C <sub>9</sub> H <sub>13</sub> N                               | 137-17-7   | -                       |
| 4,4'-thiodianiline  | C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> S               | 139-65-1   | -                       |
| 2, 4-methoxy-m-phenylenediamine   | C <sub>7</sub> H <sub>10</sub> N <sub>2</sub> O                | 615-05-4   | -                       |
| 4,4'-methylenedi-o-toluidine  | C <sub>15</sub> H <sub>18</sub> N <sub>2</sub>                 | 838-88-0   | -                       |
| <b>(7) Poly vinyl chloride(PVC)</b>   |  |            |                         |
| Poly vinyl chloride (PVC) and its mixture   | (CH <sub>2</sub> CHCl) <sub>n</sub>                            | 9002-86-2  | -                       |
| Vinyl chrolide/vinyl acetate copolymer  | -  | 9003-22-9  | -                       |
| <b>(8) Radioactive substances</b>   |  |            |                         |
| Uranium   | U  | 7440-61-1  | -                       |
| Plutonium   | Pu   | 7440-07-5  | -                       |
| Radon   | Rn   | 10043-92-2 | -                       |
| Americium   | Am   | 7440-35-9  | -                       |
| Thorium   | Th   | 7440-29-1  | -                       |
| Cesium  | Cs   | 7440-46-2  | -                       |
| Strontium   | Sr   | 7440-24-6  | -                       |
| Other radioactive substances  | -  | -          | -                       |
| <b>(9) Heptadecafluorooctane-1-sulphonic acid (PFOS)</b>  |  |            |                         |
| heptadecafluorooctane-1-sulphonic acid  | C <sub>8</sub> HF <sub>17</sub> O <sub>3</sub> S               | 1763-23-1  | -                       |
| lithium heptadecafluorooctanesulphonate   | C <sub>8</sub> HF <sub>17</sub> LiO <sub>3</sub> S             | 29457-72-5 | -                       |
| potassium heptadecafluorooctane-1-sulphonate  | C <sub>8</sub> HF <sub>17</sub> KO <sub>3</sub> S              | 2795-39-3  | -                       |
| Other heptadecafluorooctane-1-sulphonic acid kind edge compound   | -  | -          | -                       |

3) Substances restricted in Products

| Substance  | Chemical formula   | CAS No.     | Metal conversion factor |
|--|--|-------------|-------------------------|
| <b>(1) Other organochlorine compounds</b>  |  |             |                         |
| Tris(2-chloroethyl)phosphate; tris(beta-chloroethyl)phosphate; TCEP  | $(ClCH_2CH_2O)_3P=O$   | 115-96-8    | -                       |
| Tris(chloropropyl)phosphate; TCPP  | $(ClC_3H_6O)_3P=O$   | 6145-73-9   | -                       |
| Tris(dichloropropyl)phosphate; CRP; TDCPP  | $(ClC_3H_5O)_3P=O$   | 78-43-3     | -                       |
| Tetrachloro phthalic anhydride   | -  | 117-08-8    | -                       |
| Other organochlorine compounds   | -  | -           | -                       |
| <b>(2) Other brominated flame retardants</b>   |  |             |                         |
| Poly(2,6-dibromo-phenylene oxide)  | $(C_6H_2Br_2O)_x$  | 69882-11-7  | -                       |
| Tetra-decabromo-diphenoxy-benzene  | $C_{18}Br_{14}O_2$   | 58965-66-5  | -                       |
| 1,2-bis(2,4,6-tribromo-phenoxy) ethane   | $C_{14}H_8Br_6O_2$   | 37853-59-1  | -                       |
| 3,5,3',5'-Tetrabromo-bisphenol A (TBBA)  | $C_{15}H_{12}Br_4O_2$  | 79-94-7     | -                       |
| TBBA   | unspecified  | 30496-13-0  | -                       |
| TBBA-epichlorhydrin oligomer   | $(C_{15}H_{12}Br_4O_2.C_3H_5ClO)_x$                          | 40039-93-8  | -                       |
| TBBA-TBBA-diglycidyl-ether oligomer  | -  | 70682-74-5  | -                       |
| TBBA carbonate oligomer  | $(C_{15}H_{12}Br_4O_2.CCl_2O)_x$                             | 28906-13-0  | -                       |
| TBBA carbonate oligomer,phenoxy ,end capped  | $(C_7H_5O_2)(C_{16}H_{10}Br_4O_3)_x(C_6H_5O)$<br>(x=3~5)     | 94334-64-2  | -                       |
| TBBA carbonate oligomer , 2,4,6-tribromo-phenol terminated   | $(C_7H_2Br_3O_3)(C_{16}H_{10}Br_4O_3)_n(C_6H_2Br_3)$ (n=3~5) | 71342-77-3  | -                       |
| TBBA-bisphenol A-phosgene polymer  | $(C_{15}H_{16}O_2.C_{15}H_{12}Br_4O_2.CCl_2O)_x$             | 32844-27-2  | -                       |
| Brominated epoxy resin end-capped with tribromophenol  | -  | 139638-58-7 | -                       |
|  |  | 135229-48-0 | -                       |
| TBBA-(2,3-dibromo-propyl-ether)  | $C_{21}H_{20}Br_8O_2$  | 21850-44-2  | -                       |
| TBBA bis-(2-hydroxy-ethyl-ether)   | $C_{19}H_{20}Br_4O_4$  | 4162-45-2   | -                       |
| TBBA-bis-(allyl-ether)   | $C_{21}H_{20}Br_4O_2$  | 25327-89-3  | -                       |
| TBBA-dimethyl-ether  | $C_{17}H_{16}Br_4O_2$  | 37853-61-5  | -                       |
| Tetrabromo-bisphenol S   | $C_{12}H_6Br_4O_4S$  | 39635-79-5  | -                       |
| TBBS-bis-(2,3-dibromo-propyl-ether)  | $C_{18}H_{14}Br_8O_4S$                                       | 42757-55-1  | -                       |
| 2,4-dibromo-phenol   | $C_6H_4Br_2O$  | 615-58-7    | -                       |
| Other brominated flame retardants  | -  | -           | -                       |
| <b>(3) Nickel and Nickel compounds</b> *All substances containing nickel and nickel compounds come under prohibited substances |  |             |                         |
| Nickel(II) oxide   | NiO  | 1313-99-1   | 0.786                   |
| Nickel(II) carbonate   | NiCO <sub>3</sub>  | 3333-67-3   | 0.494                   |
| Nickel(II) Sulfate   | NiSO <sub>4</sub>  | 7786-81-4   | 0.379                   |
| Nickel   | Ni   | 7440-02-0   | 1.000                   |
| Nickel chloride  | NiCl <sub>2</sub>  | 7718-54-9   | 0.453                   |
| Other nickel compounds   | -  | -           | -                       |

| Substance  | Chemical formula  | CAS No.    | Metal conversion factor |
|--|---|------------|-------------------------|
| <b>(4) Arsenic and Arsenic compounds</b>         |   |            |                         |
| Arsenic  | As  | 7440-38-2  | 1.000                   |
| Gallium arsenide                                 | GaAs  | 1303-00-0  | 0.518                   |
| Arsenic pentoxide                                | As <sub>2</sub> O <sub>5</sub>                                      | 1303-28-2  | 0.652                   |
| Arsenic trioxide                                 | As <sub>2</sub> O <sub>3</sub>                                      | 1327-53-3  | 0.757                   |
| Calcium arsenate                                 | Ca <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>                    | 7778-44-1  | 0.376                   |
| Calcium arsenite                                 | Ca <sub>3</sub> (AsO <sub>3</sub> ) <sub>2</sub>                    | 27152-57-4 | 0.409                   |
| Potassium arsenite                               | KAsO <sub>2</sub>   | 10124-50-2 | 0.513                   |
| Potassium arsenate                               | KH <sub>2</sub> AsO <sub>4</sub> , K <sub>2</sub> HAsO <sub>4</sub> | 7784-41-0  | 0.416                   |
| Lead arsenate                                    | Pb <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>                    | 3687-31-8  | 0.167                   |
| Other arsenic compounds                          | -   | -          | -                       |
| <b>(5) Perfluoro-octanoic acid (PFOA)</b>        |   |            |                         |
| Perfluoro-octanoic acid                          | C <sub>8</sub> HF <sub>15</sub> O <sub>2</sub>                      | 335-67-1   | -                       |
| Perfluoro-octanoic acid ammonium                 | C <sub>8</sub> H <sub>4</sub> F <sub>15</sub> NO <sub>2</sub>       | 3825-26-1  | -                       |
| Other Perfluoro-octanoic acid kind edge compound | -   | -          | -                       |
| <b>(6) Antimony and Antimony compounds</b>       |   |            |                         |
| Antimony   | Sb  | 7440-36-0  | 1.000                   |
| Antimony trichloride                             | SbCl <sub>3</sub>   | 10025-91-9 | 0.534                   |
| Antimony pentoxide                               | Sb <sub>2</sub> O <sub>5</sub>                                      | 1314-60-9  | 0.753                   |
| Sodium antimonate                                | NaSbO <sub>2</sub>  | 15432-85-6 | 0.690                   |
| Other antimony compounds                         | -   | -          | -                       |
| <b>(7) Selenium and Selenium compounds</b>       |   |            |                         |
| Selenium   | Se  | 7782-49-2  | 1.000                   |
| Selenous acid                                    | H <sub>2</sub> SeO <sub>3</sub>                                     | 7783-00-8  | 0.612                   |
| Hydrogen selenide                                | H <sub>2</sub> Se   | 7783-07-5  | 0.975                   |
| Sodium selenide                                  | Na <sub>2</sub> Se  | 1313-85-5  | 0.632                   |
| Sodium selenate                                  | Na <sub>2</sub> SeO <sub>4</sub>                                    | 10112-94-4 | 0.418                   |
| Dimethyl selenide                                | (CH <sub>3</sub> ) <sub>2</sub> Se                                  | 593-79-3   | 0.724                   |
| Selenium oxide                                   | SeO <sub>2</sub>  | 7446-08-4  | 0.712                   |
| Other selenium compounds                         | -   | -          | -                       |
| <b>(8) Beryllium and Beryllium compounds</b>     |   |            |                         |
| Beryllium  | Be  | 7440-41-7  | 1.000                   |
| Beryllium-aluminum alloy                         | -   | 12770-50-2 | -                       |
| Beryllium chloride                               | BeCl <sub>2</sub>   | 7787-47-5  | 0.113                   |
| Beryllium fluoride                               | BeF <sub>2</sub>  | 7787-49-7  | 0.192                   |
| Beryllium hydroxide                              | Be(OH) <sub>2</sub>   | 13327-32-7 | 0.209                   |
| Beryllium phosphate                              | Be <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>                     | 13598-15-7 | 0.125                   |
| Beryllium sulfate                                | BeSO <sub>4</sub>   | 13510-49-1 | 0.086                   |
| Beryllium sulfate tetrahydrate                   | BeSO <sub>4</sub> ·4H <sub>2</sub> O                                | 7787-56-6  | 0.051                   |
| Beryl ore  | Be <sub>3</sub> Al <sub>2</sub> Si <sub>6</sub> O <sub>18</sub>     | 1302-52-9  | 0.050                   |
| Other beryllium compounds                        | -   | -          | -                       |

| Substance                                    | Chemical formula         | CAS No.    | Metal conversion factor |
|--|--------------------------|------------|-------------------------|
| <b>(9) Phthalate ester</b>                   |                          |            |                         |
| (DBP) Dibutylphthalate(DBP)                  | $C_{16}H_{22}O_4$        | 84-74-2    | -                       |
| Di(2-ethylhexyl)phthalate(DEHP)              | $C_{24}H_{38}O_4$        | 117-81-7   | -                       |
| Diisononyl phthalate                         | $C_{24}H_{38}O_4$        | 28553-12-0 | -                       |
| 1,2-benzenedicarboxylic acid diisodecylester | $C_{28}H_{46}O_4$        | 26761-40-0 | -                       |
| Butyl benzyl phthalate                       | $C_{19}H_{20}O_4$        | 85-68-7    | -                       |
| Bis(2-methoxyethyl)phthalate(DBP)            | -                        | 117-82-8   | -                       |
| Bis(n-octyl)Phthalate                        | $C_6H_4(COOC_8H_{17})_2$ | 117-84-0   | -                       |
| Other phtalate                               | -                        | -          | -                       |
| <b>(10) Bismuth and Bismuth compounds</b>    |                          |            |                         |
| Bismuth                                      | Bi                       | 7440-69-9  | 1.000                   |
| Bismuth trioxide                             | $Bi_2O_3$                | 1304-76-3  | 0.897                   |
| Bismuth nitrate                              | $BiN_3O_9$               | 10361-44-1 | 0.529                   |
| Other bismuth compounds                      | -                        | -          | -                       |

8. Revision History List

| Revision date   | Target  | Rev                              | Revision description   |
|---|---|----------------------------------|--|
| 2005.12.22  | Standards 1-1) : Policy<br>Standards 1-2) : Usage<br>Standards 2: Substance list<br>Standards 3: Substance detail | ● A<br>● A<br>● A                | Standards 1-3 of Nidec Sankyo's green procurement guideline Version 6J is the Original Version Rev.A.<br>(It complies with the company standards [Green Procurement Rules] Rev.J, Standards 1-3)<br>(It complies with company standards [Environmental Substances Control Rules] Rev.B, Attachment 1-3)  |
| <b>&lt;Revised reason&gt;</b>   |   |                                  |  |
| 2006.04.29  | Standards 1: Control standard<br>Standards 2: Substance list<br>Standards 3: Substance detail                     | ● B<br>● B<br>● B                | Standards 1 : Control standards<br>a. Fixing standards application extent to environmental substances controlled products<br>b. Changes in regulation classification for substance present in products and packaging materials as well as the subsequent deletion of standards 1- 2), changes in prohibition classification, and partial change in substance name (Short-Salted Paraffine, TBTO)<br>c. Clarification of calculation unit for substance ratio present<br>d. Setting of prohibited substance permissible contents, and exempted items.<br>e. Addition of prohibited substance in manufacturing process (PFC, SF6), change of names (Di-Chloro-Methane)<br>f. Changes in reference guide (JGPSSI-JIG), some descriptions, and others.<br>Standards2 : Substance list<br>a. Substance name changes and addition of prohibited substance in line with standards 1 revision<br>b. Modification/addition of CAS No. (TBTO, Nickel / Nickle compounds, PFC, SF6)<br>c. Changes in main legislation, corporate rules, and guides. (JGPSSI-JIG, Kyoto Protocol)<br>Standards 3 : Substance details<br>a. Substance name modification (Azo compounds)<br>b. CAS No. addition (Lead compound - Lead carbonate, Chromium(VI) compounds- Calcium chromate)<br>c. Addition of main usage (HBDPE, HBDPO - flame retardants)  |
| <b>&lt;Revised reason&gt;</b><br>1) To change standards configuration (→Delete 1-2)), this revision starts revision history control.<br>2) Review environment substance control standards in line with clarification of RoHS interpretation, customer standard changes and JGPSSI-JIG announcement (→Integration into RoHS/JGPSSI-JIG)  |   |                                  |  |
| 2007.11.5   | Standards 1: Control standard<br>Standards 2: Substance list<br>Standards 3: Substance detail                     | ● C<br>● B<br>● B                | Standards 1 : Control standards<br>a. 3.1)-(5): Addition of four kinds of method of preprocessing analysis sample to the "Analysis method of Cadmium and Lead", and specification of "sample complete dissolution" and it's method.<br>b. 3.1)-(6): Addition and specification of recommended measuring device of substances other than Cadmium and Lead.<br>→The content is matched to the "Certification of Inclusion for Environmental Substance" _ P2 "Environmental Substance List"<br>c. 3.1)-(7): Expansion of range of object of precise analysis data update.<br>: Cadmium/Lead → Prohibition priority A substances<br><br>※ This revision is not issued to the supplier by the replacement.  |
| <b>&lt;Revision reason&gt;</b><br>1) Addition of method of preprocessing analysis sample to the "Analysis method of Cadmium and Lead".<br>2) Addition of recommended analysis device of substances other than Cadmium and Lead.   |   |                                  |  |
| 2008.06.26  | Standards 1: Control standards<br>Standards 2: Substance list<br>Standards 3: Substance detail                    | Integration<br>Rev D<br>(Rev4.0) | 1. Stance in environmental substances control<br>a. Consolidate in this paragraph :<br>1) Selection standards of environmental substances<br>2) Classifications and definitions of environmental substances<br>3) Units to measure the content ratio of environmental substances<br>b. Review each paragraph as follows<br>1) Add related laws and revise terminologies<br>2) Change classifications of substance restrictions and prohibitions<br>3) Add glossary for terminologies<br>2. Substances prohibited in Products_RoHS substances<br>a. Consolidate in this paragraph the restriction conditions and analysis methods of RoHS substances<br>b. Review each paragraph as follows<br>1) Add materials and use to the restriction conditions<br>2) Review threshold values and exemptions and add data updates.<br>3. Substances prohibited in Products_Other Prohibited Substances<br>a. Consolidate in this paragraph prohibited other than RoHS, restriction conditions and related matters<br>b. Review each paragraph as follows.<br>1) Add use and materials to restriction conditions<br>2) Include new prohibited substances, review threshold values and prohibition conditions and add analysis methods<br>4. Substances prohibited in Products_Halogen free Substances<br>a. Add in this paragraph halogen free substances, restriction conditions and related matters<br>5. Substances restricted in Products<br>a. Consolidate in this paragraph restricted substances, main usage and related matters<br>b. Add partially restricted substances and analysis methods.<br>6. Substances prohibited to use in Manufacturing Process<br>a. Consolidate in this paragraph substances prohibited to use in manufacturing processes, restriction conditions and related matters<br>b. Add some restricted substances, unify terminologies for restriction conditions and include analysis methods.<br>7. Details of Environmental Substances<br>a. Consolidate in this paragraph details of restricted substances and related matters<br>b. Add some substances to be monitored and metal conversion factors |
| <b>&lt;Revision reason&gt;</b><br>1) The classifications of Standards 1 to 3 and Revision History List of this standard are deleted and integrated into NIDEC SANKYO Environmental Substances Control Standards.<br>The revision number will be Revision 4 based on old Revision D.<br>2) The entire contents of this standard will be reviewed to conform to JGPSSI-JIG and main customers' Green Procurement Standards as amended |   |                                  |  |
| 2009.07.15  | Standards 1: Control standards<br>Standards 2: Substance list<br>Standards 3: Substance detail                    | Integration<br>Rev E<br>(Rev5.0) | 2. Substances prohibited in Products_RoHS substances<br>1) 2 Add the threshold of lead content in solder<br>2) Add "Mercury" in the title < Separate by 2.3 ><br>(1)Modify contents of "(1) Pretreatment of Analysis sample"<br>(2)Change the title "Recommended measuring device" to "Recommended analysis method" and modify contents<br>3)Change the title "Analysis method of Hexavalent Chromium", and modify contents<br>4)Separate "Analysis method of PBB/PBDE" from 2.3)<br>5)Move "4) Update of precise analytical data of substance designated by RoHS" to 5)<br>3. Substances prohibited in Products_Other Prohibited Substances<br>1)Add the substance "18 Dimethyl Fumarate (DMF)"<br>4. Substances prohibited in Products_Halogen free Substances<br>1)Change the title "Usage for restriction" to "Range of restriction object", and extend the range to "Lens Actuator in a cellular phone"   |
| <b>&lt;Revision reason&gt;</b><br>1) Reconsideration of pretreatment and analysis method of RoHS substances<br>2) Addition of substances prohibited in products<br>3) Extension of range of restriction object  |   |                                  |  |
| 2009.09.25  | Standards 1: Control standards<br>Standards 2: Substance list<br>Standards 3: Substance detail                    | Integration<br>Rev F<br>(Rev6.0) | 2. Substances prohibited in Products_RoHS substances<br>1)Addition of the following division to the Pb threshold of solder.<br>•Solder in flow/dip tank, and solder used to connect PWB, parts, etc : 800ppm<br>4. Substances prohibited in Products_Halogen free Substances<br>1)The threshold value of Br/Cl is changed according to the main customer standard as follows.<br>•Br / Cl : 900 →630ppm<br>•Br + Cl : 1500→1000ppm   |
| <b>&lt;Revision reason&gt;</b><br>1) Subdivision of Pb threshold value of solder<br>2) Change of threshold value of halogen free Substances.  |   |                                  |  |