

# **Investigation Manual for the Regulated Chemical Substances**

November 2006 Ver. 2.0

OMRON Corporation

## Introduction

In the 21st century, the solution of global environmental problems and the co-existence with the environment are becoming “a basic requirement for survival of businesses”.

Omron Corporation recognizes that the environment is one of the most important tasks to tackle as part of corporate social responsibility. To realize the philosophy and declaration, the company formulated in May 2002 “Green Omron 21” that specifies the contents and goals for creating a 21st century company, under which we are practicing the environment-oriented management. In the Green Omron 21, we are performing the environmental activities in the five areas based on Eco-Mind (all employees act with high ecological consciousness).

In Eco-Products, one of the five areas, we are approaching to supply environmentally sound products through the introduction of “Product Assessment System” in September 1997 where any product is subjected to evaluation during the process of product development, and “Green Procurement System” in May 2001 to evaluate the environmental conservation activities of our suppliers.

However, EU, the United States and China have strengthened the control of regulated chemicals contained in products in recent years. These trends have put to the test the attitude of businesses toward the control of regulated chemicals furthermore. Particularly, EU’s “RoHS”(Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) banned the use of 6 substances (lead, cadmium, hexavalent chromium, mercury, PBB (polybrominated biphenyl) and PBDE (polybrominated diphenylether)) effective July 2006. Now the businesses are required to supply such products as environmentally warranted products rather than environmentally friendly products.

Under such circumstances, we decided to revise our Green Procurement policy to promote the supply of environmentally warranted products, and started our original survey system in October, 2003, in which our company specified the list of chemicals to be controlled by our own criteria.

On the other hand, Japan Green Procurement Survey Standardization Initiative (JGPSSI), which was organized mainly by the home appliance and electronics industries, agreed with Electronic Industries Alliance (EIA) to commonly specify substances to investigate in order to cope with laws and regulations about chemicals contained in products, including the RoHS Directive.

This time, OMRON reviewed the list of substances to investigate and revised the Investigation Manual into Version 2, so that it complies with the JGPSSI list, which is the de-facto standard of the home appliance and electronics industries.

We would highly appreciate it if our suppliers understand the importance of our efforts to respond to the banned and restricted chemicals and cooperate with us in this project.

November, 2006

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## 1. Purpose of Survey

The purpose of this survey is to make clear the content, content ratio, and other relevant information with respect to the chemical substances contained in the parts, materials, etc. used in Omron's products so that we can supply our customers with Omron's environmentally warranted products, thereby complying with the relevant laws and regulations as well as attempting to reduce the burden of our products on the environment.

## 2. Scope of Survey

The scope of this survey shall be as shown below:

### 2.1 Scope of products covered

- 1) Products designed, manufactured and sold by Omron
- 2) Products, the design and manufacture of which are outsourced or into which the products of other companies are purchased and incorporated, and which are sold with Omron brands (OEM products)
- 3) Products, the design and manufacture of which are entrusted with Omron by third parties (excluding, however, the parts or materials designated by the said third parties)

### 2.2 Scope of parts and materials covered

The parts, materials, etc. used in the products cited in 2.1 above (hereinafter referred to as "part(s) or material(s)") shall be the target for this survey, and the scope of them shall be as shown below:

- 1) Parts or materials (Electronic parts, processed parts, raw materials, packaging materials, packing materials, etc.)
- 2) Assembly articles such as functional units, modules and board ass'y
- 3) Components including subsidiary materials (soldering materials, adhesives, inks, greases, tapes, etc.)
- 4) Instruction manuals
- 5) Service parts for repair and accessories (CD-ROM, cables, etc.)

## 3. Definitions

### 3.1 Classification management of regulated chemical substances

Regulated chemical substances are classified into the following four categories according to the management criteria: A rank substances that are subject to immediate prohibition of application; A1 rank substances whose prohibition of application/ non-use should be practiced in order according to the decided timetable; B rank substances whose deadlines are not decided but which is subject to self acceleration of substitution; and C rank substances that are left to voluntary control but whose consumption are to be grasped.

Omron will identify and categorize the regulated chemical substances (as shown in Attachment 2) that are contained in our parts or materials constructing our products into Prohibited Substances, Non-use Substances, Substitution Accelerating Substances and Self Control Substances and promote their compliance and reduction of environmental burden according to the classification management.

1) Prohibited Substances (A rank)

The substances whose use in products (parts or materials) have been prohibited by the regulations home and abroad or which Omron has defined in its sole discretion as Prohibited Substances since they are publicly known to be an environmental heavy burden and there exist substitute substances for them. If still used, such use must be discontinued immediately.

2) Non-use Substances (A1 rank)

The substances whose regulations were formulated expressly and whose deadlines for prohibition were stipulated, and schedule for non-use/prohibition has been accelerated by Omron. If used currently, such use must be discontinued by the replacement with the available substitutes or other means before the accelerated deadlines for non-use.

3) Substitution Accelerating Substances (B rank)

Those substances whose regulations are expected to be tightened further, so that the allowance may be reduced or the use may be prohibited. We have to study or promote the acceleration of substitution.

4) Self Control Substances (C rank)

The substances whose use has not been prohibited by regulations home and abroad, but on which we are going to grasp the status of application and to reduce the consumption, recycle or treat appropriately. We will investigate the consumption and the contents in our products, and control them appropriately.

### 3.2 Part component

Part component means the minimum unit of a part or material that can be disassembled, by which it is examined if the substance in question is “Contained” or “Not Contained”.

\* Example: When a cable is picked up, the part components are the exterior sheath of cable (jacket), interior jacket of cable (insulation), electric wire, connectors, and connector terminals

Note that the surface coatings (plating, chromate treatment, coating, etc.) are handled as a separate part component from the base material.

### 3.3 “Contained” or “Not Contained”

“Contained” means that manufacturers have intentionally used, filled or adhered (called “intentionally used”) chemicals to products or parts or materials for the purpose of continually maintaining the function or quality of them regardless of the type of constituent or the amount contained. Insofar as impurities are concerned (see Section 3.6), however, it shall be regarded as “Contained” if the content exceeds the allowable concentration (threshold), and “Not Contained” if not exceeds the allowable concentration.

However, with regard to substances used for purposes outside the applicable scope of the RoHS Directive and ELV Directive, they are regarded as “Contained” only if the content exceeds the allowable concentration although they are used intentionally, as an exception.

Ensure that such materials not containing the Prohibited Substance are employed for the part component of metallic molds, tools and jigs, machines and equipment that have direct contact with products.

If any regulated chemical substance used in the manufacturing process is not present in the final product, its status is regarded as "Not Contained". (Example: When parts or materials are cleaned with volatile solvents, it is regarded as "Not Contained" since such solvent does not remain basically.)

Note: The definition of "intentionally used" in "Annex II of EC Directive 2002/525/EC on ELV reads as follows: "deliberately utilized in the formulation of a material or component where its continued presence is desired in the final product to provide a specific characteristic, appearance or quality

### 3.4 Content ratio

- 1) To make a compatibility evaluation of the allowable concentrations of the target regulated chemical substances cited below, focusing on RoHS Directive Prohibited Substances, the content ratio is calculated by the ratio of the mass of the part component to that of the regulated chemical substance contained therein, both of which are of the same material, and entered in Sheet 2.
- Content ratio (ppm)={Mass of the regulated chemical substance contained in the part component (g) / Mass of the part component(g)} $\times 10^6$   
(Example: Lead content ratio in the case:[Amount of PVC in a sheath covering: 100g → Breakdown: PVC:89.5g; Antimony as flame retardant for PVC: 10g; and lead:0.5g]

$$\text{Lead content}=(0.5/100) \times 10^6=5,000\text{ppm}$$

\* Target regulated chemical substances:

RoHS Directive Prohibited Substances (lead, cadmium, hexavalent chromium, mercury, PBB and PBDE (specific brominated flame retardants)) and polyvinyl chloride, and brominated flame retardant as Substitution Accelerating Substances.

- 2) To calculate the content of regulated chemical substances in an Omron's product, the content ratio is calculated by the ratio of the mass of the whole part or material to that of the regulated chemical substance contained therein and entered in Sheet 3.
- Content ratio (ppm) = {Mass of regulated chemical substance contained in the whole part or material (g) / Mass of the whole part or material (g)}  $\times 10^6$   
(Example: Antimony content in the PVC wire material)
  - (1) Covering : Amount of PVC 100g → Breakdown: PVC:89.5g; Antimony as flame retardant for PVC: 10g; and lead:0.5g]
  - (2) Electric wire: Copper wire(50g), solder coating on the copper wire (5g)  
$$\text{Antimony content} = \{10/(100+50+5)\} \times 10^6=64,500\text{ppm}$$
- 3) Content ratio of the regulated chemical substances in raw materials (molding compounds, metallic materials) or subsidiary materials (solders, adhesives, inks, etc.) is calculated by the ratio per unit weight and entered in Sheet 3. However, if any of the target regulated substances cited in paragraph 3.4.1) above has surface coating, entry is to be made in Sheet 2 as well.
- Content ratio (ppm)=Ratio of regulated chemical substances per unit weight

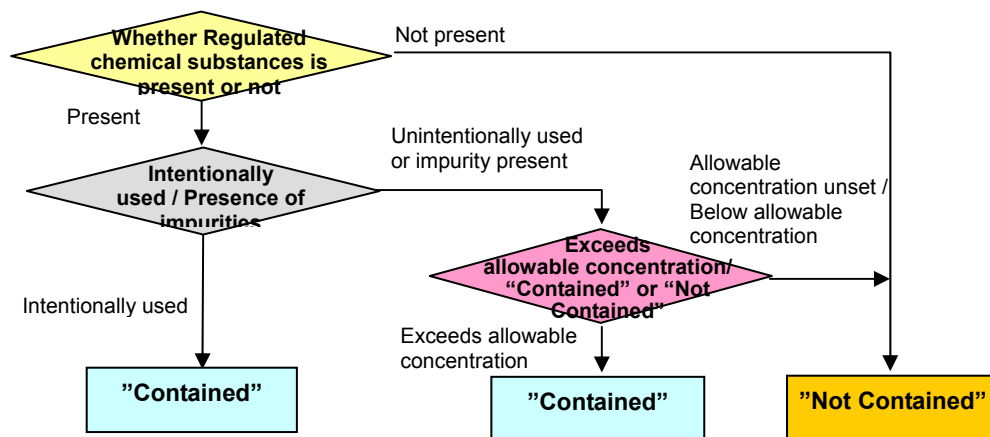
### 3.5 Allowable concentration (threshold)

In this manual, the allowable concentration (threshold) is the maximum content

ratio of a Prohibited Substance or a Non-use Substance allowable as an impurity to the part or material. If it exceeds the allowable concentration, it is regarded as “contained”, and if not exceeds, it is regarded as “not contained.” Since there is no setting of allowable concentration for Substitution Accelerating Substances and Self Control Substances, they are regarded as “not contained” unless intentionally used. (See Figure 1)

With respect to substances used for purposes outside the applicable scope of the RoHS Directive and ELV Directive, the allowable content ratio/content volume is applied although they are used intentionally, and they are regarded as “contained” if the content exceeds the allowable concentration.

Fig. 1 Relation among “Contained”, “Not Contained”, impurities, and allowable concentration



### 3.6 Impurities

Substances not intentionally used, filled or adhered, or those present in natural materials and technically impossible to eliminate during raw materials refining process or technically impossible to eliminate during synthetic reaction process (residual matter such as residual solvents and unreacted monomers), or those added for the purpose of accelerating reaction during manufacturing process but not maintaining the functions or qualities of the products or materials continually (for example, catalysts), or those contained in the raw materials for alloys (ores, etc.) and impossible to eliminate during manufacturing process, are regarded as impurities.

### 3.7 Certificate of Non-inclusion for Regulated Substances

This is a certification by which the supplier guarantees that none of the Prohibited Substances or Non-use Substances cited in the regulated chemical substances lists of Attachment 2 are intentionally used in the parts or materials supplied as a principle (“Not Contained”).

### 3.8 Changes in technical matter (design and process) of parts or materials

Design changes include changes of drawings in shape, material, dimension, circuit, software, etc. and product standards / specifications (change of materials of part or material, change of plating treatment, etc.)

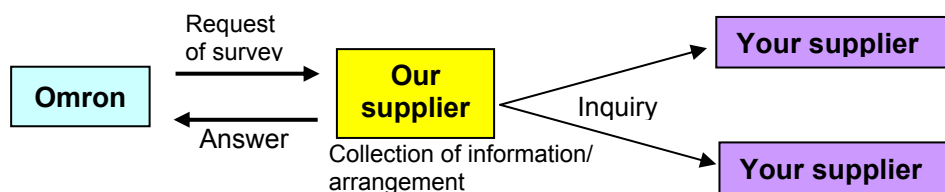
Process changes include the changes in the matters relating to the description in the manufacturing standards (process quality confirmation drawing, operation manual, inspection manual, etc.) and changes in places of production and production facilities.

## 4. Contents of Survey

### 4.1 Survey basis

We are going to survey the content, content ratio, part component, and intended use of the regulated chemical substances for each part or material.

The suppliers are requested to collect the information on the substances “Contained” in each of the parts or materials comprising your products delivered to Omron (including subsidiary materials such as inks, adhesives, etc.) and return the results to us on your own responsibility. If there is no information on any of them, please inquire each of your suppliers of them. After such are fully done, you could arrange the information in order for each part or material to answer our questions.



### 4.2 Survey forms

- (1) "Certificate of Non-inclusion for Regulated Substances"
- (2) "Survey Form for the Regulated Chemical Substances (Sheet 1)" includes the check if any Prohibited Substance or Non-use Substance is "Contained or Not", your Phase-out Plan, etc.
- (3) "Survey Form for the Regulated Chemical Substances (Sheet 2)" for content, content ratio, etc. on a part component basis.
- (4) "Survey Form for the Regulated Chemical Substances (Sheet 3)" for content ratio, etc. on a part or material basis.
- (5) "Declaration for Phase-out of Regulated Substances" for guarantee of your Phase-out Plan.

### 4.3 Procedure for returning the completed survey forms

Prepare your answers for the survey forms in the form of electronic file in accordance with the flow diagram illustrated in Fig. 2 of Page 11, and upload it to Omron's website in the Internet.

### 4.4 Instructions for survey forms

- 1) "Certificate of Non-inclusion for Regulated Substances"

If none of Prohibited Substance (A rank) and Non-use Substance (A1 rank) are "contained", enter the information on your part or material and the company information, and then put signature of your responsible person.

(Note) Responsible person means a person who is in a position to guarantee the contents entered in the Survey Forms for the Regulated Chemical Substances and to take the responsibility for any unexpected accidents (occurrence of compensation for damages, etc.).

When the column for parts list is not enough for your entry, please prepare the attached sheet for parts list.

- 2) Deliberate check on the substances whose allowable concentrations (threshold) are specified among Prohibited Substances/Non-use Substances
- If any substance was not intentionally used and the impurities are estimated to be contained above the allowable concentration, analysis (measurement) should be performed. If you judge it is unlikely to be the case, complete the Attachment 6 "Declaration for Phase-out of Regulated Substances" after checking it with the manufacturing specifications.
- 3) Duration of guarantee for "Not Contained"
- The guarantee for "Not Contained" shall continue from the issue date until the use and manufacture of the part or material is discontinued. However, you may be required to produce the analytical data when requests arise from Omron customers in some cases.
- 4) "Survey Form for the Regulated Chemical Substances (Sheet 1)"
- (1) For the reason for submitting the survey form, check "new part or material".
- (2) When it is confirmed by the Survey Form 3 described in the paragraph 6) below that none of Prohibited Substances or Non-use Substances is contained in the part or material, check "Not Contained" in Q1, and complete the "Certificate of Non-inclusion for Regulated Substances" described in paragraph 1) above and submit it to us. If the part or material contains any of Substitute Accelerating Substances (B rank) or Self Control Substances (C rank), fill out Sheet 3 described in paragraph 6) below as well.
- (3) If any of Prohibited Substances or Non-use Substances is "Contained", fill out Sheets 2 and 3, and in the case of Non-use Substances, enter the deadline for non-use and so on in response to Q2 and Q3, and complete the "Declaration for Phase-out of Regulated Substances" (attachment 7) for guarantee of the Non-use Plan and submit it to us. Note that, if any Prohibited Substance is "Contained" or both Prohibited Substance and Non-use Substance are "Contained", you need not enter the column for Non-use Plan in Q2. You are required to address the replacement promptly as well as report it to the section-in-charge of Omron.
- If the substitution of Non-use Substance is delayed behind the deadline for replacement of Prohibited Substance, such supplier is required to apply for the approval by submitting Survey Forms and "Declaration for Phase-out of Regulated Substances" again to the Omron's sections-in-charge along with Attachment 8 "Process Change Report (PCR)" set forth in subparagraph 7) (2) below after the completion of replacement of Prohibited Substance.
- 5) "Survey Form for the Regulated Chemical Substances (Sheet 2)"
- (1) If the part or material contains RoHS Directive Prohibited Substances (lead, cadmium, mercury, hexavalent chromium, PBB and PBDE) and polyvinyl chloride and brominated flame retardant as Substitution Accelerating Substances, enter the substance number, substance name, part component, purpose of addition, mass of the part component, content, and type of data on a part component basis.
- (2) For judgment of "Contained" or "Not Contained", "Contained" is entered if intentionally used or impurities are above the allowable concentration, while "Not

Contained" if below the allowable concentration. However, it is necessary to enter the data if the impurities are below the allowable concentration.

Analysis is the values obtained from the analysis (measurement) made for check, and the design specifications include the other values (manufacturing specifications, inspection certificate, theoretical values, etc.).

- (3) If polyvinyl chloride or brominated flame retardant is intentionally used in the part or material, it is regarded as "Contained".
- (4) No need to enter in Reserve columns 1&2.
- 6) "Survey Form for the Regulated Chemical Substances (Sheet 3)
  - (1) If the part or material contains any of the regulated chemical substances defined by Omron (Attachment 2: List of Regulated Chemical Substances), enter content ratio, part component, and purpose of addition on a part basis.

Note, however, that the part component and purpose of addition entered in Sheet 2 for the regulated chemical substances described in the paragraph 5) above should be entered, too. (In this case, the main part component and purpose of addition should be entered here.)
  - (2) The judgment of "Contained" or "Not Contained" is made on the same basis as in Sheet 2. If any of Substitution Accelerating Substances/Self Control Substances is intentionally used in the part or material, "1" is entered in the "Contained or Not" column, and, if not, there is no need to enter.
- 7) Procedures for new parts or materials and technical changes of the existing parts or materials
  - (1) If a new part or material is subjected to examination

The Survey Forms set forth in section 4.2 above shall be submitted to the section-in-charge of Omron together with the ordinary necessary documents.
  - (2) If there occurs the necessity of technical (design/process) changes of the existing part or material

If the technical change is accompanied by material change, changes of printing, coatings, plating treatment, changes of adhesives, lubricants, solders, etc., and change of place of production (including the change of suppliers), then you are required to investigate it from time to time, and apply for the approval submitting the Survey Forms set forth in 4.2 above and Attachment 8 "Process Change Report (PCR)" together with the ordinary documents to the section-in-charge of Omron.

#### 4.5 In the case any of Prohibited Substances/Non-use Substances is "Contained"

- 1) If any of Prohibited Substances (A rank) is "Contained" in the existing part or material, you are required to report the fact to the section-in-charge of Omron and exclude the part or material in question immediately. The purchase of the existing part or material in such a state shall be discontinued in principle.
- 2) If any of Non-use Substances (A1 rank) is contained, such part or material, on which Non-use Plan has not been established by Omron's designated deadline, shall not be purchased in principle.

Note 1) In case the answer is not returned by the deadline for return, such supplier may be subject to suspension of transaction.

Note 2) This manual specifies the contents of survey common to Omron Group companies. However, additional survey may be conducted with different contents in some cases.

Note 3) How to enter the “Certificate of Non-inclusion for Regulated Substances” and “Declaration for Phase-out of Regulated Substances” if the supplier is using the part or material Omron has designated (the target supplier’s processed products)

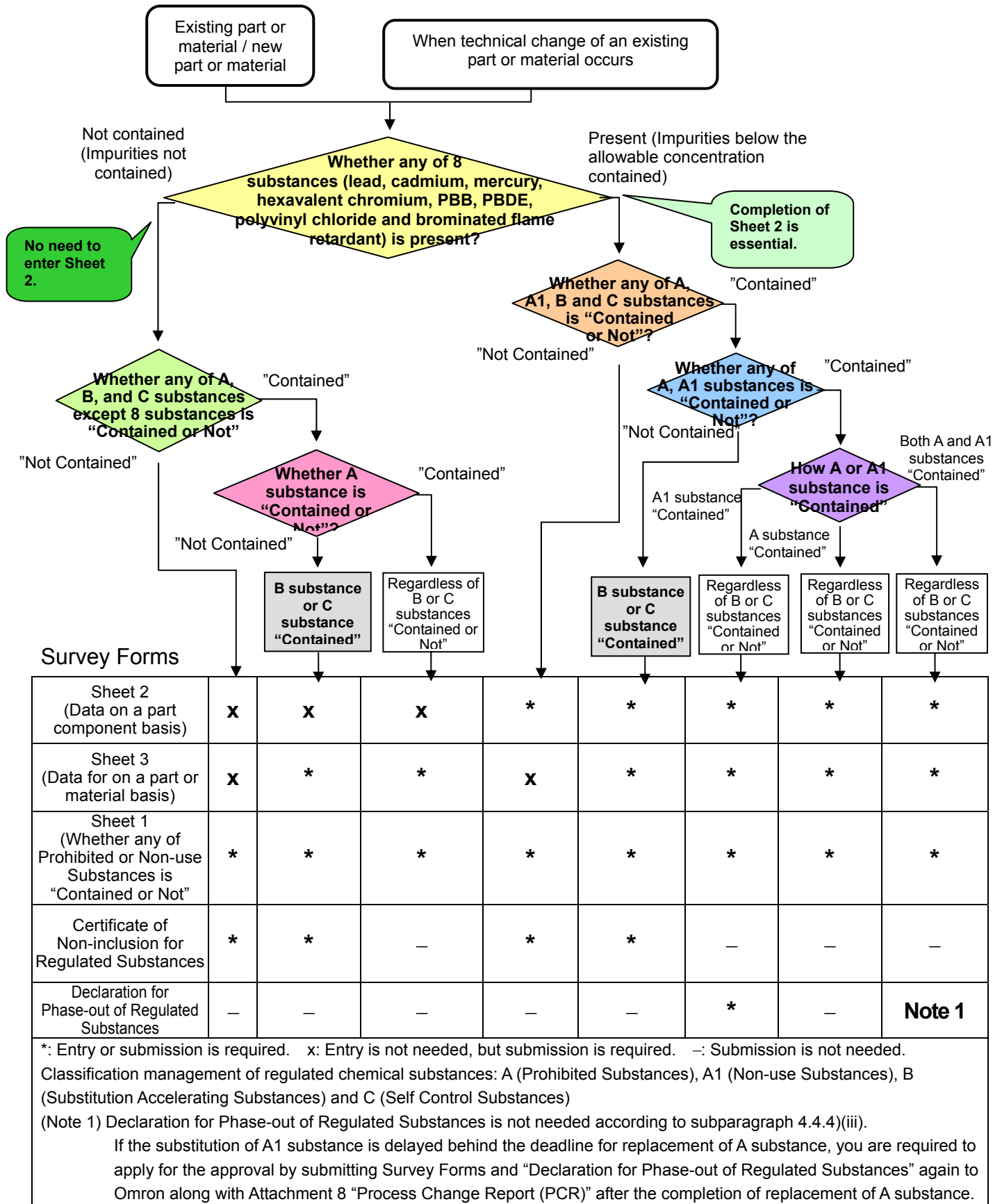
If A or A1 substance is contained in the raw materials and surface treatment that Omron has designated (\*1), the supplier can not change the specification unless Omron’s approval is obtained. In that case, such supplier is requested to complete the “Certificate of Non-inclusion for Regulated Substances” and “Declaration for Phase-out of Regulated Substances” concerning the parts or materials, for which the supplier has selected the other manufacturers, grades (or types) and surface treatment and the subsidiary materials to be used in the manufacturing process, such as lubricants, detergents, and solders, and submit it to Omron after entering the following proviso in the target product or part and material column:

“provided that the materials (surface treatments) designated by Omron shall not be covered by this document”

However, if any of the parts or materials Omron specified by the name of standards, such as JIS (for example, metal), it will be selected by the supplier, so that the above proviso shall not apply to such case.

\*1: “designate” means to designate the manufacturer, grade (or type), and thickness as necessary, in the drawings or by written specifications for the materials (molding compounds, metallic material, other materials, paints, additives, oils, etc.), and to designate the specifications for surface treatment (solder plating, rustproof treatment, etc.) in the drawings or by written specifications.

**Fig. 2 Flow of Answering the Survey Forms**



**\* Please return all Sheets 1 to 3 regardless of necessity of entry.**

## 5. Guide to Entry

### 5.1 Survey items

#### (1) Sheet 1

This is a questionnaire on whether any Omron's defined Prohibited Substance (A)/ Non-use Substances (A1) is "Contained or Not" in your part or material, Non-use Plan, and substitution.

Survey Form for the Regulated Chemical Substances (Sheet 1)			
(ii) Reason for submission		<input checked="" type="radio"/> New part or material <input type="radio"/> Change of existing part or material	
[Part Information]		[Supplier Information]	
(iii) Product Number <small>(English one byte characters)</small>		(i) Omron's factory-in-charge	Site ID <small>(English one byte characters)</small>
Category Name		Section-in-charge	Survey form ver. Nov.1, 2006
Catalog Number		Person-in-charge	Standard Manual ver. 2.0
(iv) Manufacturer		Date	
(v) Mass of Part or Material (g)		(vii) Company	
(vi) Note		Supplier Code No. <small>(English one byte characters)</small>	
		Section	
		Person in charge	
		TEL <small>(English one byte characters)</small>	
		FAX <small>(English one byte characters)</small>	
		E-mail <small>(English one byte characters)</small>	

(Note) If the target part or material is a cable, paint and the like, enter the mass per unit length or unit volume and note its unit in the "Note" column.

Survey Item	Answer	Remarks
Q1 Whether any of Omron's defined Prohibited Substances (A) or Non-use Substances (A1) is "Contained" or "Not Contained"	<input type="radio"/> Contained → Prepare the certification of "Not Contained" <input checked="" type="radio"/> Not Contained	For the definition of "Contained", see Manual for Survey. If A substance is contained, report it to Omron and exclude promptly.
Q2 (If "A1 substance Contained" is the answer in Q1) Whether Non-use Plan has been established or not	<input type="radio"/> Have a plan → Deadline for phase-out and substitution <input checked="" type="radio"/> Have no plan <input type="radio"/> No plan	If "Not Contained" is the answer in Q1, no need to answer here. If "Have a plan" is your answer in Q2, enter "the deadline for phase-out". If "Have a substitution" is your answer in Q3, enter "the deadline for completion of preparation for substitution". If needed, you may be required to produce its detailed schedule.
Q3 (If A substance is Contained in Q1, or no Non-use Plan in Q2), whether you have a substitute or not.	<input checked="" type="radio"/> Have a substitute → Type of substitute for non-use <input type="radio"/> Have no substitute → Reason	If "Have a plan" is your answer in Q2, enter the "Type of the part or material containing the Non-use Substance". If "Have a substitution" is your answer in Q3, enter the "Type of the substitute part or material".

- (i) Omron's factory-in-charge; Section-in-charge; Person-in-charge; Site ID; Survey form ver.; and Standard

These are the information on the sections in charge of this project and the survey form to be entered by Omron side. Do not enter or alter anything.

- (ii) Reason for submission

Check "New part or material" or "Change of an existing part or material". Existing parts or materials are regarded as new parts or materials here. (In default, "New part or material" has been checked.)

In the case of "Change of an existing part or material", apply for the approval by Omron submitting Attachment 8 "Process Change Report (PCR)" concurrently.

- (iii) Product Number; Category Name; and Type/Material (Catalog Number)

Enter the product number, category name and type/material (catalog number) employed by Omron for the target existing part or material subject to this survey. In the Survey Forms, pick up the applicable items from among the list of target part or material we are sending you and enter them. Note that you should put the English product name into "Category Name" column and the English type into "Catalog Number" column.

(Note 1) If it is a commercial product, enter its type (e.g. ERJP06D1100v). If it is a processed product, write down the material (e.g. T1.5 A1050P).

(iv) Name of manufacturer / Machined Parts

Put the English name of the manufacturer and the Machined Parts of the target part or material in the column "Manufacturer".

(Note 2) If it is a commercial product, enter the name of the manufacturer (e.g. NEC, Stanley). If it is a processed product, write down the Machined Parts (name of the product) (e.g. E5CN, H3CR-A)

(v) Mass of Part or Material (g)

Enter the total mass of the part or material in gram (g) (significant figure:2; minimum unit: Please enter it if it is below 0.001g). If the target part or material is a cable, paint and the like, enter the mass per unit length or unit volume and note its unit in the "Note" column.

Example: In the case of cables, "The mass of the part is mass per meter (cm, mm)". In the case of paints, "The mass of the part or material is mass per L (cc, mL)".

If the part or material is raw materials (molding compounds, metallic materials) or subsidiary materials (solder, adhesives, greases, inks, etc.), there is no need to enter.

In the case of a sheet of multi-piece PCBs of uniform specifications and a sheet of combined PCBs of different specifications, enter the mass of the portion illustrated in the following figures:

\* In the case of a sheet of multi-piece PCBs of uniform specifications:

☐ Mass of the striped area (A)

A	A
A	A
(Ear substrate / guide portion)	

\* In the case of a sheet of combined PCBs of different specifications:

☐ Mass of the striped area (A + B)

A	B
A	B
(Ear substrate / guide portion)	

(vi) Note

Write down special notes (for example, "a product whose manufacture is expected to be suspended), if any.

(vii) Date of Entry

Enter the date when the answer to the Survey has been completed. Year should be expressed in four digits with 'year of grace', and month and day in two digits, with hyphens put between year, month, and day.

(For example, 2003-11-01, yyyy-mm-dd)

(viii) Company, Supplier's Code No., Section, Person in charge, TEL, FAX, E-mail

Enter the company name, supplier's code number, section, person-in-charge, TEL, FAX and E-mail of your company. The supplier here means the primary supplier from the standpoint of Omron. If the part or material is delivered through a trading company, the supplier's information should be the information on the trading company, not that of the manufacturer.

Put the English company name into "Company" column, English section name into "Section" column, and the name of the person-in-charge in English into "Person in charge" column.

- (ix) Q1: Whether any of Prohibited Substances (A)/Non-use Substances (A1) is “Contained or Not”

If any one of Prohibited Substances (A)/ Non-use Substances (A1) included in Attachment 2 “List of Regulated Chemical Substances” is contained, check “Contained” of “Answer” column. If none of the listed substances is contained, check “Not Contained”, and then prepare Attachment 6: “Certificate of Non-inclusion for Regulated Substances” and submit it to Omron. (In default, “Contained” is checked.) If “Contained” is the answer, then check either “A substance Contained” or “A1 substance Contained” according to the substance contained.

“Contained” includes the following (see Fig.1 of P.6):

- (1) Any of Prohibited Substances (A) intentionally used is regarded as “Contained” regardless of constituents or content.
- (2) Any of Non-use Substances (A1) intentionally used for the application and under the applicable conditions of A rank and A1 rank, it is regarded as “Contained”. If it only corresponds to C rank, it is not regarded as “Contained”.
- (3) If the content ratio of Prohibited Substance (A) as Impurities to the whole part or material and that of Non-use Substance (A1) as Impurities in each part component constructing the part or material exceeds the allowable concentration specified for each substance, such impurities are regarded as “Contained”.

- (x) Q2: Whether Non-use Plan for Prohibited Substance or Non-use Substance has been established or not

If any of Non-use Substances is “Contained” and the Non-use Plan has been established, check “Have a plan”, and select the deadline (year and month) from the pull-down menus. If “Have a substitute” is your answer in Q3, write down the “Date of completion of preparation for substitution” in the column for the Deadline. And complete Attachment 7. “Declaration for Phase-out of Regulated Substances” and submit it to Omron concurrently. If you have no Non-use Plan, check “Have no plan” and write down the reason. (In default, “Have a Plan” is checked.)

If you have no Non-use Substance in Q1, you need not answer here. If A substance is contained, you also need not answer here, but instead report it to Omron and address the replacement promptly.

- (xi) Q3: Substitution

If only Prohibited Substance is “Contained” in Q1 or there is no Non-use Plan in Q2, and you have a substitute, then check “Have a substitute”, and enter the type of the substitute. If “Have a plan” is your answer in Q2, write down the “type of the Non-use Substance”. If you don’t have a substitute, then check “Have no substitute” and write down the reason. If you have a substitute, it may be considered to be a candidate for replacement, but if not, the purchase may be suspended.

This is a survey on a part component basis concerning the status of the content of RoHS-targeted substances, polyvinyl chloride and brominated flame retardant.

Since there is no concept of “part component” in raw materials (molding compounds, metallic materials (not plated) and subsidiary materials (solder, adhesives, inks, etc.), there is no need to enter.

As for the surface coating on metallic materials and electric cables etc. that have "part component", it is needed to fill out this sheet.

**Survey Form for the Regulated Chemical Substances (Sheet 2)**

**(iii)** [Part Information]

Product Number	
Category Name	
Catalog Number	
Manufacturer	
Mass of Part or Material (g)	
Note	

**(i)** [Supplier Information]

Omron's factory-in-charge	Site ID
Section-in-charge	Survey form ver.
Person-in-charge	Standard
	Nov. 1, 2006
	Manual ver. 2.0

**(vii)** [Supplier Information]

Date	Supplier Code No.
Company	
Section	
Person in charge	
TEL	
FAX	
E-mail	

Substance No.	Substance Name	CAS No.	Part Component Where Regulated Chemical Substance is Contained	Purpose of Addition	Mass of the Part (g)	Content (g)	Content Ratio (ppm)	Type of Data	Judgment of Whether the Substance is "Contained or Not"	Reserve 1
<b>(ix)</b>			<b>(x)</b>	<b>(xi)</b>	<b>(xii)</b>	<b>(xiii)</b>	<b>(xiv)</b>	<b>(xv)</b>	<b>(xvi)</b>	<b>(xvii)</b>

- (i) Omron's factory-in-charge, Site ID, Section in charge, Person in charge  
(iii) Product No., Category Name, Catalog Number  
(iv) Manufacturer  
(v) Mass of Part or Material  
(vi) Note  
(vii) Date of Entry  
(viii) Company / Supplier's Code No. / Section / Person in charge / TEL / FAX / E-mail
- Since the above 8 items are transferred from Sheet 1, you need not enter them.

- (ix) Substance No., Substance Name, CAS No.

Select the substances "Contained" in part components of the part or material from the pull-down menus of Substance No., or Substance Name. You need not enter CAS No.'s as they are input automatically.

“Contained” means herein that a substance is present in the part or material or the part component thereof, whether or not it is “intentionally used” or “impurities” and if the amount is below the allowable concentration. Note that it is different from the definition set forth in section 3.3 in this Manual.

If the same chemical substance is “Contained” in multiple part components of the part or material, select the corresponding number of Substance Names so that entries be made for all the part components. However, if the materials or content ratios of multiple part components are the same, put together such multiple part components as the same part component. In that case, the mass and content of the part components should be entered in an aggregate of all the part components put together.

(Example: For IC lead terminals, enter the aggregate by putting together the number of lead terminals.)

(x) Part component where regulated chemical substance is “Contained”

Enter the name of the part component where any regulated chemical substance is “Contained”.

For the names of part component, use the Omron’s designated name listed in Attachment 1 and Separate volume; Detail Part Name”.

When the proper name can not be found in the “Detail Part Name”, refer to other parts drawings. If you can’t find it for all efforts, then answer it by a common name or the name of part component used by your company.

- When the target for the survey is a single part like electronic parts, the name of part component should be the one written in the construction drawings and list of components of the said part component.

If there are multiple names of part component, enter them as a single part component (in a single line).

Example 1) In the case of multi-layer ceramic condensers: Ceramic dielectric material, interior electrode

Example 2) In the case of electrolytic capacitors: lead terminals, electrolytic solution, electrode foil

Example 3) In the case of switches: Rubber contacts, springs, plastic covers

Example 4) In the case of screws, steel plates, rods: mother material, surface treatment (chromate, plating)

Example 5) In the case of batteries or accumulators: Cells (whole part)

Example 6) In the case of electric cables: Conductors, surface treatment of conductors (plating), interior jacket, exterior sheath

\* Even for a single constructional element such as an electric cable without sheath, enter "base material" / "main material".

- If the target for the survey is a machine or device, equipment, or unit composed of multiple electronic parts or mechanical parts, regard the name written in the construction drawings and parts list of the said part (product) as the name of part component and enter it in the manner shown below:

If it covers multiple parts, enter the same name over the multiple lines.

(Superior name of part component) / (Name of part or material) / (Name of part component)

Example 1) Printed circuit board unit / Resistance 1 / Lead terminal (for example, if “Contained” in 100KΩ resistance)

Example 2) Printed circuit board unit / Resistance 2 / Lead terminal (for example, if “Contained” in 10 KΩ resistance)

Example 3) Power supply unit / Heat sink / plating

(xi) Purpose of addition

Enter the intended use of the chemical substance “Contained”.

Example 1) Stabilizer, plasticizer, coloring agent, flame retardant, anti-corrosion agent, constituent of solder, etc.

Example 2) Main constituent, improvement of heat stability, improvement of electric properties, improvement of mechanical properties, etc.

Example 3) Impurities (when it is clear that they are not intentionally used)

(xii) Mass of part component

Enter the mass of the part component where a chemical substance is “Contained” in the unit of gram (g) with two significant figures (Please enter the minimum unit if it is below 0.001g, in which case, however, the indication of the figure will be 0.000g.) You need not enter it for metallic materials with surface treatment.

For the mass of part component of batteries or accumulators, enter the mass per piece of cell (unit cell). In the case of a battery pack, calculate the mass of the set as a part component. Also, in the case of electric cables, enter the mass of the part component per unit.

(xiii) Content

Enter the mass of the chemical substance “Contained” in each part component in the unit of gram with two significant figures (Please enter the minimum unit if it is below 0.001g, in which case, however, the indication of the figure will be 0.000g.). Content should come from the analysis or design specifications (theoretical value, calculated value or design value). If there is a fluctuation of content according to manufacturing lots, answer the maximum value in principle.

You need not enter it for metallic materials with surface treatment. Calculate the content in a battery or an accumulator on a unit cell basis, and, in the case of a battery pack, calculate the content on a battery basis.

(xiv) Content ratio

The content ratio of the chemical substance “Contained” in each part component is expressed in the unit of ppm with two significant figures (minimum unit: 1 ppm). You need not enter it since it is automatically calculated from the entries in (xii) and (xiii).

The content ratio is calculated by the formula: Content of a chemical substance in the part component (g) / mass of the part component (g) where the chemical substance is “Contained”.

However, when the target is metallic material with surface treatment, enter the content ratio of the chemical substance in the surface treatment. In calculating it, erase the calculation formula preset in the cell and overwrite it. For the calculation method for it, see paragraph 5.2.(8).

(xv) Type of data

If the content and content ratio are based on the analysis (measurement), check “Analysis”, and if theoretical value, calculated value or others, check “Design specifications”.

(xvi) Judgment of whether the substance is “Contained or Not”

When the status of containing in each part component (Purpose of addition, content ratio)

corresponds to the application, applicable conditions and allowable concentration of A rank or A1 rank specified in Attachment 2: List of Regulated Chemical Substances, check “Contained (A/A1)”.

When it corresponds to the application, applicable conditions and allowable concentration of B rank or C rank specified in the list, check “Contain (B/C)”.

If it does not correspond to either of the above, check “Not Contained”. (In default, “Contained (A/A1)” is checked.)

\* \*If there is even one checked as “Contained (A/A1)”, your answer in Q1 will be “Contained”.

(xvii) Reserve 1&2

No need to enter as it is not used in the survey based on this Manual.

\* Example for rounding the actual measurements:

Item	Measurement data	Value for the answer
*Mass and content (g) of parts or part components where chemical substances are “Contained” (Significant figure: 2, and the value is rounded off after the second digit. Minimum unit: Please enter it if it is below 0.001g)	<ul style="list-style-type: none"> <li>· 2547.05g</li> <li>· 25.4705g</li> <li>· 0.0025g</li> <li>· 0.000456g</li> </ul>	<ul style="list-style-type: none"> <li>2500g</li> <li>25g</li> <li>0.0025g</li> <li>0.00046g</li> </ul>
*Content ratio (ppm) (The significant figure is 2, and the value is rounded off after the second digit. (minimum unit: 1ppm))	<ul style="list-style-type: none"> <li>· 464500ppm</li> <li>· 465.4ppm</li> <li>· 40.4ppm</li> <li>· 0.5ppm</li> <li>· 0.055ppm</li> </ul>	<ul style="list-style-type: none"> <li>· 460000ppm</li> <li>· 470ppm</li> <li>· 40ppm</li> <li>· 1ppm</li> <li>· 0ppm</li> </ul>

## (iii) Sheet 3

This is a survey on the status in which any of Regulated Chemical Substances is "Contained" in the part or material including Substitution Accelerating Substances / Self Control Substances. The 25 substances are the targets of the control, as a general rule, although Sheet 3 has retained the conventional 207 substances. However, if investigation for substances other than the 25 is needed in response to some customer requirements, Omron may ask your suppliers to investigate additionally.

Survey Form for the Regulated Chemical Substances (Sheet 3)				(i) Omron's factory-in-charge		Site ID	
				Section-in-charge		Survey form ver. Nov.1, 2006	
				Person-in-charge		Standard Manual ver. 2.0	
<b>(iii) [Part Information]</b>				<b>(vii) [Supplier Information]</b>			
<b>(v) Product Number</b>				Date			
Category Name				Company			
Catalog Number				Section			
Manufacturer				Person in charge			
Mass of Part or Material (g)				TEL			
				FAX			
				E-mail			

Please fill in the form with respect to the 25 substances specified in the Regulated Chemicals List attached as attachment 2 to Survey Manual (fill in cells that are not colored gray). There is no need to fill in the gray cells unless otherwise requested by Omron.

Substance No.	Substance Name	Listed or not	No. in PRTR Law	CAS No	Whether "Contained or Not" (English one byte character)	Content Ratio (ppm) (English one byte character)	Part component	Purpose of Addition	Old Substance No.
					(ix)	(x)	(xi)	(xii)	
A-154	Lead and its compounds	●	1-230						B-004
A-155	Cadmium and its compounds	●	1-060						B-002
A-156	Hexavalent chromium and its compounds	●	1-069						B-001
A-157	Mercury and its compounds	●	1-175						B-003
A-058	PBB (polybrominated biphenyls)								A-058~059
A-063	PBDE (polybrominated diphenylethers)								A-060~063, A-124
A-153	Polyvinyl chloride			9002-86-2					C-123
B-013	Brominated flame retardants	●							-
A-123	Ozone layer depleting substances	●							A-001~057
A-125	Dioxins	●	1-179						A-064~069
A-070	PCB (Polychlorobiphenyl) group	●	1-306						A-070
A-071	Polychloronaphthalene			70776-03-3					A-071
A-072	HCB (Hexachlorobenzene)			118-74-1					A-072
A-073	Aldrin			309-00-2					A-073
A-074	Dieldrin			60-57-1					A-074
A-075	Endrin			72-20-8					A-075

(i) Omron's factory-in-charge, Site ID, Section in charge, Person in charge

(iii) Product No., Category Name, Catalog Number

(iv) Manufacturer

(v) Mass of Part or Material

(vii) Date of Entry

(viii) Company / Supplier's Code No. / Section / Person in charge / TEL / FAX / E-mail

Since the above 8 items are transferred from Sheet 1, you need not enter them.

(ix) Whether "Contained or Not"

If any regulated chemical substance is "Contained" in the part or material subject to the Survey, enter "1" (in an English one byte character). If "Not Contained", you need not enter anything.

As far as 8 substances inquired in Sheet 2 are concerned, the contents of (ix) and (x) will be transferred from your corresponding answers entered in Sheet 2 and you need not enter here. However, in the case of metallic materials with surface treatment in which any of 8 substances questioned in Sheet 2 is "Contained", there is no transfer from Sheet 2. In that case, erase the calculation formula preset in the cell and overwrite it. For the calculation method for it, see paragraph 5.2.(8).

"Contained" herein includes the following (see Fig.1 of P.6):

- (1) Any of regulated chemical substances intentionally used is regarded as "Contained" regardless of constituents or content.

- (2) If the content ratio of Prohibited Substance as Impurities to the whole part or material and that of Non-use Substance as Impurities in each part component constructing the part or material exceeds the allowable concentration specified for each substance, such impurities are regarded as “Contained”.
- (3) In the C rank application and applicable conditions of Substitution Accelerating Substances (B), Self Control Substances (C) and Non-use Substances, the impurities are regarded as “Not Contained”.

(x) Content ratio

The content ratio of the chemical substance “Contained” in each part or material is expressed in the unit of ppm with two significant figures (minimum unit: 1 ppm). The content ratio is calculated by the formula: Content of the chemical substance (g) / mass of the target part or material (g).

(When the column for content ratio is blank, we may inquire you of it later.)

Here, enter the content ratio only if the chemical substance is “Contained” according to the definition of section 3.3.

(Example: As it is regarded as “Not Contained” if the content of impurities is below allowable concentration or its allowable concentration is not specified, you need not enter.)

Only the data on the answers “Contained” in Sheet 2 are aggregated automatically and input in Sheet 3. If you have manually erased the calculation formula, you are required to aggregate it by inputting the data on “Contained” manually in Sheet 3.

(xi) Part component where any regulated chemical substance is “Contained.”

Enter the name of the part component where any regulated chemical substance is “Contained”.

For the name of part component, use the Omron’s designated name listed in Attachment 1 and Separate Volume; Detail Part Name.

When the proper name can not be found in the part component drawings, refer to other parts drawings. If you can’t find it for all efforts, then answer it by a common name or the name of part component used by your company. If the same chemical substance is “Contained” in multiple part components, enter the major part component or the whole part component separated with comma “,”. As the status of the content of Non-use Substances and polyvinyl chloride and brominated flame retardant as Substitution Accelerating Substances has been input in Sheet 2 on a part component basis, enter the main part component here.

- When the target for the survey is a single part like electronic parts, the name of part component should be the one written in the construction drawings and list of components of the said part component.

Example 1) In the case of multi-layer ceramic condensers: Ceramic dielectric material, interior electrode

Example 2) In the case of electrolytic capacitors: lead terminals, electrolytic solution, electrode foil

Example 3) In the case of switches: Rubber contacts, springs, plastic covers

- If the target for the survey is a machine or device, equipment, or unit composed of multiple electronic parts or mechanical parts, regard the name of part components or part or material written in the construction drawings and parts list of the said part (product) as the

name of part component and enter it in the manner shown below:

Example 1) In the case of Printed circuit board unit: Printed circuit boards, electronic parts, solder for connection, etc.

Example 2) In the case of power supply unit: Heat sinks, transformers, printed circuit boards, electronic parts, power supply cover

(xii) Purpose of addition

Enter the intended use of the chemical substance "Contained". As the status of the content of the six substances controlled by RoHS; and polyvinyl chloride and brominated flame retardant as Substitution Accelerating Substances; has been input in Sheet 2 on a part component basis, enter the purpose of addition for the main part component here.

Example 1) Stabilizer, plasticizer, coloring agent, flame retardant, rustproofing, constituent of solder, etc.

Example 2) Main constituent, improvement of heat stability, improvement of electric properties, improvement of mechanical properties, etc.

Example 3) Impurities (when it is clear that they are not intentionally used), etc.

## 5.2 Instructions for the Survey on Chemical Substances Contained in Parts and Materials

### (1) Concept on "Contained"

In principle, if definitely intentionally used or contained, the substance is regarded as "Contained" independently of its constituent or content. If unintentionally used, it is handled as "Impurities", which are regarded as "Contained" if the content is above the allowable concentration (threshold).

The chemical substances on which no answer has been made are regarded as "Not Contained".

### (2) Calculation of content

Express the content by analysis or design specifications. If there is some variation in content according to manufacturing lot, answer with the maximum value in principle.

In calculating the content in part components, the chemical substance contained in the purchased part or material constructing the part or material should be covered along with that contained during the manufacturing process.

### (3) Calculation of content of metals and their compounds

Express the content of metallic compounds not by the amount of the compounds contained, but by the value converted as the amount of metal element contained in the compounds. The conversion into metal element can be done by multiplying the molecular weight of the compound by the conversion factor. Typical conversion factors are given in Attachment 3. Illustrative List of Regulated Chemical Substances.

With alloys, enter the content of the chemical substances in the alloy.

With the chemical substances not covered by the Attachment 3. Illustrative List of Chemical Substances, investigate their conversion factors and prepare the answer using them. (Conversion factors can be calculated by [molecular weight of the metal element contained in the compound] / [molecular weight of the compound])

Example 1) The amount of antimony in containing 100mg of antimony trichloride ( $\text{SbCl}_3$ ) is obtained by multiplying its conversion factor, 0.534, i.e. (antimony trichloride)  $100\text{mg} \times 0.534 = 53\text{mg}$  (amount of antimony)

Example 2) In the case of eutectic solder, express the content not by the amount of solder but the amount of lead in the solder.

Note 1) The oxide films present on metal surface in normal conditions should be excluded.

### (4) Calculation of content in the case that a chemical substance corresponds to multiple chemical substances.

If a chemical substance corresponds to multiple chemical substances, calculate each corresponding content individually.

Example) If 100 mg of lead chromate (II) is "Contained", give the contents of lead and hexavalent chromium in both columns for "lead and its compounds" and "hexavalent chromium compounds".

$100\text{mg}$  (amount of lead chromate)  $\times$  0.641 (conversion factor of lead) = 64mg (lead content)

$100\text{mg}$  (amount of lead chromate)  $\times$  0.161 (hexavalent chromium) = 16mg (hexavalent chromium content)

(5) Chemical substances used during the manufacturing process

You need not enter the content of any chemical substance that is used during the manufacturing process, if it is not present in the final product, such as solvent, cleaning agents, foaming agents.

(6) Examples of part or material in which any of the target chemicals is expected to be “Contained”

The target chemical substances are very likely to be “Contained” in the below listed parts and materials. You are requested to check them to a satisfactory extent.

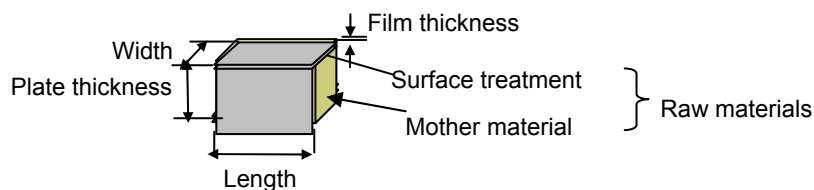
- Grease and other lubricants that are used for the parts having movable parts such as bearing, lever, etc.: Lead, polychlorinated naphthalene, chlorinated paraffins.
- Flame retardants for plastics: Specific brominated flame retardants such as PBB and PBDE, brominated flame retardants, antimony, etc.
- Polyvinyl chloride, flame retardant and stabilizers for lead wire covering: lead, antimony, cadmium, etc.
- Special metals (alloys) for improvement of electric stability of contacts: cadmium, gold, silver, etc.
- Additives for rubber products such as belts, rollers, bushes, and tubes: lead, PBB, PBDE, etc.
- Color code and other display paints: cadmium, lead, hexavalent chromium

(7) Use of ozone depleting substances during the manufacturing process

The use of ozone depleting substances for cleaning parts or materials during manufacturing process is prohibited. Their intentional addition for part or material is also prohibited.

(8) Calculation of content ratio and content in the surface treatment of raw materials (soldering plating, chromate, etc.)

The content ratios of the 8 regulated chemical substances including RoHS Directive chemical substances on a part component basis in Paragraph 3.4.1) are those of the target regulated substances “Contained” in the part components of the same material. Calculate the content ratio and content in surface treatment referring to the following samples:



Example 1) Solder plating

(i) Lead content ratio of solder plating in Sheet 2 (on a part component basis)

- Lead content ratio of soldering plating in part components is the composition ratio of lead in solder plating. Enter the value by manual inputting, while you need not enter the content and the mass of the part component.

Example) If the composition ratio of lead in solder plating is 10%,  
Content ratio of lead =100,000 ppm

(ii) Lead content ratio in solder plating in Sheet 3 (on a part or material basis)

- 1) When the amount of solder plating as feedstock is determined by measurement:

After the weight of a certain length of feedstock and the amount of solder plating are worked out, calculate the content ratio of lead using the following equation and enter it by manual inputting:

$$* \text{ Content ratio of lead} = [(\text{Weight of solder plating (g)} \times \text{Composition ratio of lead in solder plating}) / (\text{weight of feedstock (g)})] \times 10^6 \text{ ppm} \dots (I)$$

- 2) When the amount of solder plating is not determined:

· After the weight of a certain length of feedstock is worked out or measured, calculate the amount of solder plating according to the following equation and find the content ratio of lead using the equation (I) above.

$$* \text{ Weight of solder plating} = \text{Film thickness (mm)} \times \text{surface area (mm}^2\text{)} \times \text{specific gravity of solder} \times 10^{-3} \text{ (g)}$$

Specific gravity of solder

Composition of solder	Sn-5Pb	Sn-10Pb	Sn-37Pb	Sn-40Pb	Sn-50Pb
Specific gravity	7.4	7.6	8.4	8.5	8.9

#### Example 2) Chromate treatment

(i) Content ratio of hexavalent chromium in Sheet 2 (on a part component basis)

- Find the content ratio of hexavalent chromium in the chromate treatment of a part using the composition ratio of hexavalent chromium in chromate treatment solution (8.7%) from the table below.

$$\text{Content ratio of hexavalent chromium} = 87,000 \text{ ppm}$$

(Mass of part component covered by the chromate treatment of part component and the content of hexavalent chromium may not be entered.)

(ii) Content ratio of hexavalent chromium in Sheet 3 (on a part or material basis)

- 1) When the amount of hexavalent chromium as feedstock is determined by measurement:

After the weight of a certain length of feedstock and the amount of hexavalent chromium are worked out, calculate the content ratio of hexavalent chromium using the following equation, and enter it by manual inputting:

$$* \text{ Content ratio of hexavalent chromium} = (\text{Content of hexavalent (g)} / (\text{weight of feedstock (g)})) \times 10^6 \text{ ppm} \dots (II)$$

- 2) When the amount of hexavalent chromium is not determined:

· After the weight of a certain length of feedstock is worked out or measured, select the conversion factory by chromate treatment in the table below, calculate the amount of hexavalent chromium according to the following equation with the conversion factor and find the content ratio of hexavalent chromium using the equation (II) above.

$$* \text{ Content of hexavalent chromium} = \text{Conversion factor in (ii) of the table below} \times \text{surface area (mm}^2\text{)} (\mu\text{g}) \dots (III)$$

Data for calculating the content ratio and content of hexavalent chromium in chromate treatment (Source: Technical materials of a certain screw manufacturer and plating company)

Item		Standard Value
(i) Composition ratio of hexavalent chromium in chromate treatment solution		8.7%
(ii) Conversion factor for content of hexavalent chromium in chromate treatment	Bright chromate treatment	$0.01 \mu\text{g}/\text{mm}^2$
	Color chromate treatment	$0.04 \mu\text{g}/\text{mm}^2$
	Black chromate treatment	$0.07 \mu\text{g}/\text{mm}^2$
	Chromate plated steel plate	$0.003 \mu\text{g}/\text{mm}^2$

(9) Calculation of content ratio and content in the surface treatment of screws (Example: hexavalent chromium in chromate)

(i) Content ratio of hexavalent chromium in the Survey Sheet 2 (on a part component basis)

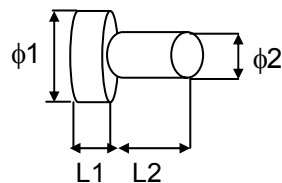
- When the content ratio is not available, use the value in (8), Example 2, (i) above.

(ii) Content of hexavalent chromium in the Survey Sheet 3 (on a part or material basis)

- When the content of hexavalent chromium in a screw is not available, use the equation (III) in (8), Example 2, (ii), 2) above. If the surface area is not available, use the below equation.

\* Method for roughly calculating the surface area of screws (calculated as a column)

$$\text{Surface area} = \phi 1 \times (\phi 1/4) \times \pi \times 2 + \phi 1 \times \pi \times L1 + \phi 2 \times \pi \times L2 \text{ (mm}^2\text{)}$$



## 6. Statutory and Regulated Environment-related References of Regulated Chemical Substances Subject to This Survey

### 6.1 Prohibited Substances (A rank)

Level A substances specified by Japan Green Procurement Survey Standardization Initiative (JGPSSI) and Level B substances (polyvinyl chloride: for limited purposes only) of Omron's self-regulation are specified as Prohibited Substances

#### 1) Japanese laws and regulations

(i)	Substances listed in Annex A, B, C and E of Montreal Protocol in "The Law Concerning The Protection of The Ozone Layer Through The Control of Specified Substances and Other Measures"
(ii)	Class 1 and Class 2 Specified Chemical Substances under the "Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances" (Chemical Examination Law)
(iii)	Manufacture-prohibited substances under "Industrial Safety and Health Law" (Safety and Health Law)
(iv)	Nuclear substances under the "Law for the Regulations of Nuclear Source Material, Nuclear Fuel Material and Reactor" (Nuclear Substances Control Law)

#### 2) Laws and regulations of foreign countries

(i)	Marketing-banned substances in "EU: Directive concerning the restrictions on the marketing and use of certain dangerous substances and preparations" (76/769/EEC Marketing Restriction Directive)
(ii)	Marketing-banned substances in "EU Council Directive on batteries and accumulators containing certain dangerous substances" (Directive 91/157/EEC on Batteries).
(iii)	EU regulation on heavy metals in "Guidelines 94/62/EC of the European Parliament and the Council regarding Packaging and Packaging Waste" (Packaging Waste Directive 94/62/EC)
(iv)	Prohibited substances in "EU Directive on End-of-life Vehicles 2002/525/EC" (ELV Directive)
(v)	Prohibited substances in "EU Directive on Restriction on the Use of Designated harmful substances in electrical and electronic equipment 2002/95/EC" (RoHS directive)
(vi)	Marketing-banned substances in "Germany: Chemical Substance Prohibition Law"
(vii)	Marketing-banned substances in "Germany: Regulations on Articles for Daily Use"
(viii)	Prohibited substances in "Denmark: Laws on Environmentally Harmful Substances"
(ix)	Marketing and use-banned substances in "Holland: Laws on Environmental Hazardous Substance"
(x)	Heavy metals in "United States: Regulations on Heavy Metals in Packaging Materials"
(xi)	Ozone layer depletion substances in "United States: Clean Air Act (CAA)"

#### 3) Omron's self-regulatory substances

(i)	Prohibited substances with limited applications: Polyvinyl chloride in packing and packaging materials
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## 6.2 Non-use Substances (A1)

There are no laws or regulations on non-use substances.

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## 6.3 Substitution Accelerating Substances (B rank)

We defined the substances, on which the tightening of regulations under the below-listed laws home and abroad is very likely to encourage the reduction of consumption or prohibition of use and utmost efforts to avoid the obligation for separation for disposal.

(i)	Those substances on which separation is mandatory in "EU: Waste Take-back Directive on Waste Electrical and Electronics Equipment, 2002/96/EC" (WEEE)
(ii)	Omron's self control substances (limited applications) Polyvinyl chloride for covering of electric wires, codes, tubes, etc.

## 6.4 Self Control Substances (C rank)

"Self Control Substances" are Level B substances specified by JGPSSI, except for non-use substances and substitution accelerating substances.

Note: Reasons for JGPSSI to designate substances as Level B.

- (a) Materials and chemicals that have profound effect from the viewpoint of environment, health, and safety.
- (b) Materials and chemicals of which harmful waste management may be required.
- (c) Materials and chemicals that may have adverse effect on the disposal of used products.

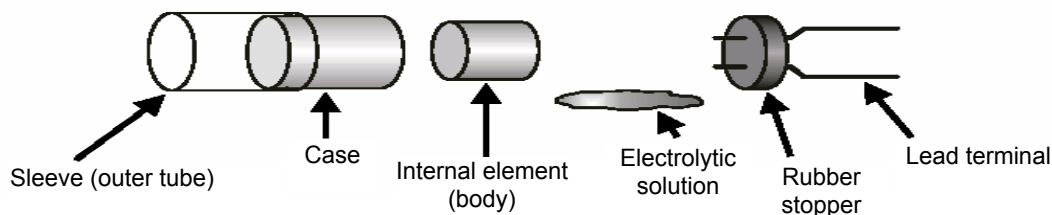
# 7. Revision

This manual is subject to revision depending on changes in social conditions and trend of legal regulations.

## Attachment 1. Examples of Part Component Unit

The following are an informative guide for the names of part components that will serve as a reference for filling out the part component column in the Survey Forms. Calculate and enter the content of target substances in other parts referring to the calculation examples shown below and the component parts given in the following pages.

(Note: The collection of part components above is cited from the “Manual for Survey of Chemical Substances Contained in Parts and Materials” issued by JGPSSI)  
[Examples of names for part components and calculations of contents of chemicals substances]



\* Sample contents for each part component and their calculations

Component	Applicable Substance	Content	Calculation
Aluminum electrolytic capacitor: Mass: 5.0g			
Sleeve (outer tube): Polyvinyl chloride Weight: 0.3g	Polyvinyl chloride Phthalate ester Antimony trioxide	50% 40% 10%	$0.3\text{g} \times 0.50 = 150\text{mg}$ $0.3\text{g} \times 0.40 = 120\text{mg}$ $0.3\text{g} \times 0.10 \times 0.835 = 25\text{mg}$ (Antimony trioxide being a metallic compounds, multiply the content (composition ratio) by the metal conversion factor, 0.835, that is cited from the Sample Substance List to obtain the amount of metal antimony.)
Case	No applicable substance		
Internal element (body) Weight: 2.0g	Antimony Lead (lead in solder)	20.0mg 9.0mg	20.0mg Solder: 22.5mg, the composition ratio of lead in the solder (40%): $22.5 \times 0.4 = 9.0\text{mg}$
Electrolytic solution	No applicable substance		
Lead terminal Weight: 0.1g	Lead (lead in solder plating)	1.0mg	Solder plating: 10mg, the composition ratio (10%): $10 \times 0.1 = 1.0\text{mg}$
Rubber stopper	No applicable substance		

The responses are as follows:

Sheet 2:

Substance Group	Part Component	Intended use	Mass of part component	Content	Content ratio
Lead and its compound	Internal element (body)	Solder	0.023g	0.009g	2,000ppm
	Lead terminal	Solder plating	0.010g	0.001g	100,000ppm
Polyvinyl chloride (PVC)	Sleeve	Main constituent	0.30g	0.15g	500,000ppm

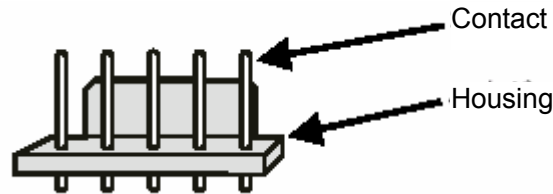
Sheet 3:

Substance Group	Content	Part Component	Intended use	Details of content calculation
Antimony and its derivatives	9,000ppm	Sleeve, etc.	Flame retardant	← 25mg + 20mg = 45mg
Lead and its compound	2,000ppm	Lead terminal, etc.	Solder plating	← 9mg + 1mg = 10mg
Polyvinyl chloride (PVC)	30,000ppm	Sleeve	Main constituent	—
Phthalate esters	24,000ppm	Sleeve	Plasticizer	—

Calculate and enter the content of target substances in other parts referring to the calculation examples shown above and the component parts in the following.

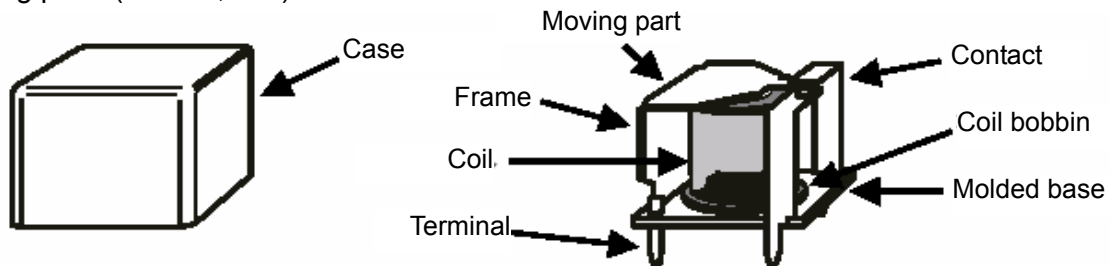
### [Component Part Example 1] Connectors

Component parts: Housing and contacts



### [Component Part Example 2] Switch, relays and other parts with mechanical components

Component parts: Part case (molded plastics, etc.), metal parts (lever, frame, terminal, etc.), moving parts (contact, etc.)



\* Pay particular attention to special metals (alloys) with an intended use as flame retardants for plastics, for imparting electrical properties, and lubrication to contacts.

### [Component Part Example 3] Surface-mounted chip parts

Component parts: Terminal, Main body

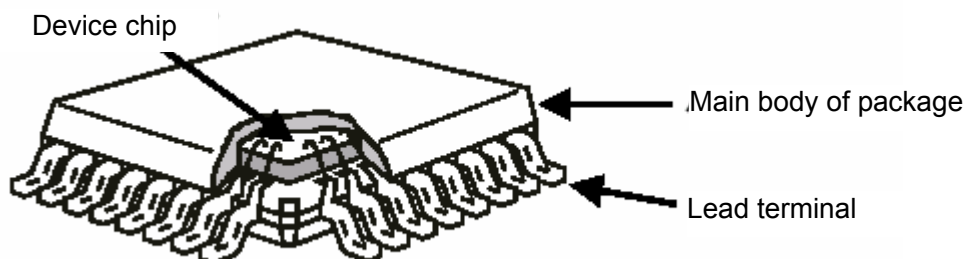


\* When the main body of the part is composed of multiple materials, and the applicable substance is present therein, break it down.

e.g. Part (main body) → ceramic and internal electrode

### [Component Part Example 4] Semiconductor devices

Component parts: Lead terminal (lead frame, etc.), main body of package (molded plastic, etc.), and device chip

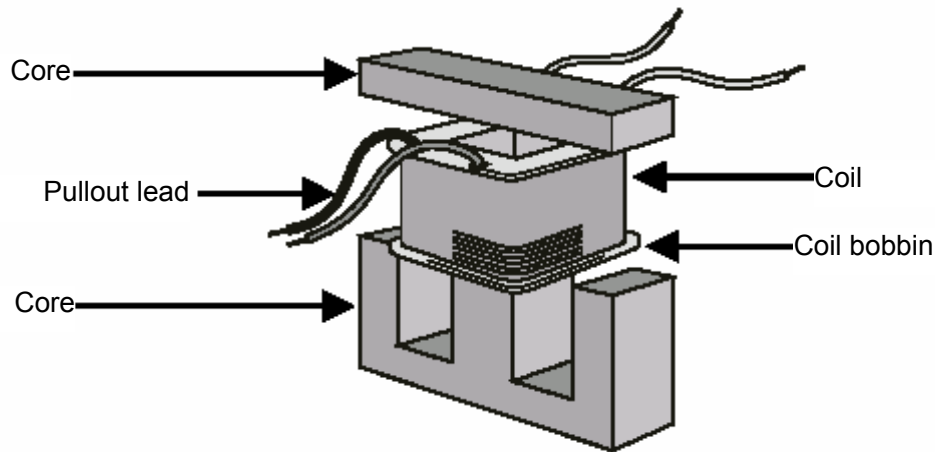


\* Pay particular attention to the flame retardants in the plastics for main body of package and the material and treatment of lead.

\* Make a response on the device chips to the extent possible.

#### [Component Part Example 5] Transformers and inductors

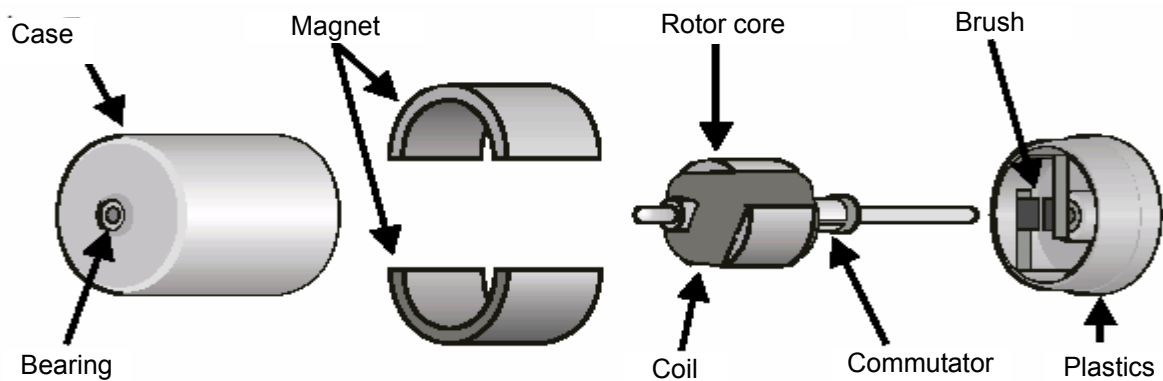
Component parts: Core, coil, bobbin, lead wire, insulator, case frame, etc.



\* Pay particular attention to flame retardants in the molding compounds or insulating parts, impregnants in the coils, PVC and flame retardants in the lead wires.

#### [Component Part Example 6] DC motors

Component parts: Part case (molded plastics, etc) metal parts (shaft, rotor core, terminal, frame, etc.), brush, magnet, coils, and others.

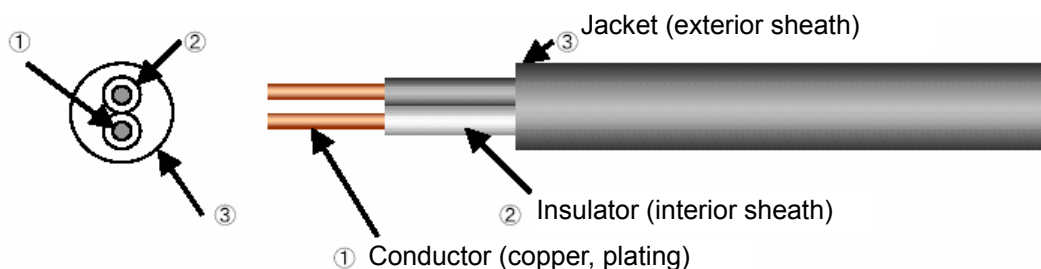


\* Pay particular attention to special metals (alloys) with an intended use as flame retardants for plastics, for imparting electrical properties and lubrication to commutators, and grease in bearings.

\* If lead wires and electronic circuits are included in the DC motor, calculate the content of the whole part from those of the respective component parts.

#### [Component Part Example 7] Electrical cables (power cord)

Component parts: Conductor (copper, plating), insulator (interior sheath), and jacket (exterior sheath)



## Attachment 2. List of Regulated Chemical Substances

\* With respect to the substances covered by Part Survey, compliance with JGPSSI will start with Ver 2.0. However, nickel compounds (C Substance) are still listed in order to utilize the survey data and survey sheet before the revision of Part Survey Manual (Ver1.0-1.2).

### 1. Prohibited Substances (A rank)

- Substances whose use in parts or materials is prohibited.

If "Contained", such part or material must be excluded immediately.

A substances: 16, A1 substances: 0

B substances:1, C substances: 8

OC. Substance No. A rank	Substance Name (Substance Group Name)	Illustrative List (*=listed)	CAS No.	Another Names	Sample Application	Allowable Concentration (threshold) (ppm)	Applicable Laws and Regulations													Old OC Sub- stance No..	
							Ozone Layer Protection (Non-use Substance)	Chemical Examination (Class 1,2 Specified Substance)	Poisonous and Deleterious Substances (Manufacture-prohibited substances)	Poisonous and Deleterious Substances (Use-prohibited substances)	Control (Substances Management Law (Special management substances))	Waste Management Law (Special management substances)	Basel Domestic Law (Specified substances)	PRTR Law (Class 1,2 specified substances)	76/769/EEC (Use-prohibited substances)	Germany Chemical Prohibition (Prohibited substances)	Germany Daily Use Prohibition (Prohibited substances)	Holland Laws on Environmental Hazardous Substance (Prohibited substances)	Other legal regulation (examples) (i)94/62/EEC (Packaging Waste Directive) (ii)2002/525/EC (ELV) (iii)2002/95/EC (RoHS) (iv)US: Regulations on Heavy Metals in Packaging Materials		
123	Ozone layer depleting substance	*	—	CFC, halons, HCFC, HBFC, brominated methyl	Detergents, refrigerants, foaming agents, halon extinguishers	Intentional addition/use prohibited	x			D	x			1	x	x		x	US CAA, JGPSSI,	Illustrative List	
058	PBB (polybromobiphenyls)		—	PBDs	Plastics, wire covering, tubes, flame retardant for PCB, paints, adhesives (incl. sealing agents)	Intentional addition prohibited and to be 1,000ppm or less.								x		x	x		x	RoHS Directive JGPSSI	A-058
063	PBDE (polybromodiphenylethers)		—	PBBOs, PBBEs, PBDOs, DBDPO													x	x		x	RoHS Directive, JGPSSI
070	PCB (polychlorobiphenyl) group	*	—		Heating medium, insulating oil	Intentional addition prohibited, and to be 50ppm or less.		1			x	x	x	1	x	x		x	JGPSSI	A-070	
071	Polychloronaphthalene (>C <sub>3</sub> )		70776-03-3		Fungicides, feedstock for organic synthesis	Intentional addition prohibited		1											JGPSSI	A-071	
078	Bis (tri-n-butyltin) oxide		56-35-9	TBTO	Ink, fungicides, ship bottom paints	Intentional addition prohibited		1					x	1	x	x		x	JGPSSI	A-078	
128	Specific organic tin compounds (except for bis(tributyltin)oxide)	*	—	Tributyltin compounds, triphenyltin compounds	Fungicides, ship bottom paints, ink, anti-mold agents	Intentional addition prohibited		2					x	1	x	x		x	JGPSSI	Illustrative List	
105	Asbesto (incl. chrysotyle, etc.)	*	1332-21-4	Asbestos	Heat resistant materials	Intentional addition prohibited and to be 1.000ppm or less			x			x	x	S	x	x		x	JGPSSI	A-105	

(Note) Chemical Examination Law: 1 → Class 1 Specified Chemical Substance under the said law, and :2 → Class 2 Specified Chemical Substance under the said law; Poisonous and Deleterious: P → Poisonous substances specified in Article1 of the Ministerial Ordinance, and D → Deleterious substances specified in Article 2 of the Ministerial Ordinance; (Holland) → Laws on Environmentally Hazardous Substance; PRTR Law: S → Special Class 1 Specified Chemical Substances, :1 → Class 1 Specified Chemical Substances, and :2 → Class 2 Specified Chemical Substances;

OC. Substance No. A rank	Substance Name (Substance Group Name)		Illustrative List (*=listed)	CAS No.	Another Names	Sample Application	Allowable Concentration (threshold) (ppm)	Applicable Laws and Regulations														Old OC. Sub-stance No..
								Ozone Layer Protection (Non-use Substance)	Chemical Examination (Class 1,2 Specified Substance)	Safety and Health (Manufacture-prohibited substance)	Substances (Poisonous/Delicious substances) targeted by the law	Waste Management Law (Special management substances)	Basel Domestic Law (Specified substances)	PRTR Law (Class 1,2 specified substances)	76/769/EEC (Use-prohibited substances)	Germany Chemical Prohibition (Prohibited substances)	Germany Daily Use Prohibition (Prohibited substances)	Holland Laws on Environmental Hazardous Substance (Prohibited substances)	Other legal regulation (examples) (i)94/62/EEC (Packaging Waste Directive) (ii)2002/525/EC (ELV) (iii)2002/95/EC (RoHS) (iv)US: Regulations on Heavy Metals in Packaging Materials			
140	Chlorinated paraffin (carbon chain: 10-13)			—	Chloroparaffin	Flame retardant, vulcanization accelerator, pigment, ink	Intentional addition prohibited and to be 10,000ppm or less								x		x	x			JGPSSI	F-001
143	Azo dyes and pigments		*	—		Textile, fur products, dye for resins, pigment	Such applications prohibited as the substance comes in touch with human bodies continually, or intentional addition prohibited, or to be released 30ppm or less				x				x	1	x	x	x	x	JGPSSI  *Not applicable to A rank substances for the use of long-lasting contact with a human body unless its release exceeds 30ppm.	F-002
151	Radioactive substances		*	—		Fuel, measurement	Intentional addition prohibited														Nuclear Substances Regulation Law, JGPSSI	New
153	Polyvinyl chloride	A rank		9002-86-2	PVC	Packing materials	Intentional addition prohibited														Omron Self Control Substances, JGPSSI *PVC used for the B rank applications is applicable to B rank Substances.	C-123
		B rank				Other applications (electric wires, tubes, etc.)	—															
154	Lead and its compounds		*	—		Shown in the table below	Shown in the table below					D	x	x	x	1	x	x		x	Shown in the table below JGPSSI	B-004
155	Cadmium and its compounds		*	—		Shown in the table below	Shown in the table below					D	x	x	x	s	x	x		x	Shown in the table below JGPSSI	B-002
156	Hexavalent chromium and its compounds		*	—		Shown in the table below	Shown in the table below					D	x	x	x	s					Shown in the table below JGPSSI	B-001
157	Mercury and its compounds		*	—		Shown in the table below	Shown in the table below					P/D	x	x	x	1	x	x		x	Shown in the table below JGPSSI	B-003

Classification Management of Lead, Cadmium, Hexavalent chromium and Mercury and their compounds by Application (1wt% = 10,000ppm)

OC. Sub-stance No.	Substance Name (Substance Group Name) Illustrative List (listed or not?)	Rank	Applications and Applicable Conditions	Allowable Concentration (Threshold) (ppm or wt%)	Deadline for prohibition of its use in parts or materials (Note2)	Applicable Laws and Regulations
A 154	Lead and its compounds  * Listed in Illustrative List	A	Packing/package (corrugated cardboard boxes, boxes, bags, cushion materials, tapes, etc.)	100ppm or less (Note1)	To be prohibited immediately in case of non-compliance with the conditions set forth in (Note 1).	94/62/EEC (Packaging Waste Directive) US Regulations on heavy metal on packaging materials
		A	Batteries, accumulators	When 4,000ppm or less /unit cell, or above 4,000ppm , it bears the marking of a battery and is easy to detach.	Immediately prohibited.	91/157/EEC (Directive on Batteries) Denmark: Regulations on Batteries. Not applicable to A rank substances when it bears the marking of a battery and is easy to detach.
		A	Paint, ink, stabilizers for plastics, lubricants	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited.	76/769/EEC (Marketing Restriction Directive) Germany: Chemical Prohibition Law
		A	Products (parts or materials) covered by ELV Directive (e.g. PVC electric wires and connectors containing lead, identification paints, inks, stabilizers for plastics and rubber, stabilizer in rustproof paints, pigment, light resistance agent, carbon brush used in electric motors, glass of electric lamps, etc.)	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited.	2002/525/EC (ELV Directive)
		A	Products (parts or materials) covered by RoHS Directive (e.g. PVC electric wire/ connectors, paint, ink, stabilizers for plastics and rubber containing lead; lead in solder, lead in solder/solder plating of board or electronic part, lead in glass of electric bulbs, and lead in the stabilizers or additives used for electroless nickel plating and electroless gold plating (Note 4))	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited	2002/95/EC (RoHS Directive) (Note 4: according to OMRON's view)
		A	Lead contained in bearing-shells and bearings	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited	2002/525/EC (ELV Directive)
		A	Lead contained in free-cutting aluminum	0.4wt% or less	Immediately prohibited	
		A	Lead contained in aluminum alloys	0.4wt% or less	Immediately prohibited	2002/95/EC (RoHS Directive)
		A	Lead contained in steel products (including zinc plating steel) (RoHS, ELV)	0.35wt% or less	Immediately prohibited	2002/95/EC (RoHS Directive) 2002/525/EC (ELV Directive)
		A	Lead contained in copper alloys (RoHS, ELV)	4wt% or less	Immediately prohibited	
		A	Lead contained in high-melting point solder	Pb alloys containing above 85wt% of lead	Immediately prohibited	2002/95/EC (RoHS Directive) *Applicable to A rank substances when the lead content in high-melting point solder is below 85wt%.
		A	Lead contained in solder comprising more than 2 elements for the connection between the pin of a microprocessor and the packages	More than 80wt% and less than 85wt%	Immediately prohibited	*Applicable to A rank substances limited to this application when the lead content is not more than 80% or 85% or more (If high-melting point solder is used, the application for the high-melting point solder applies.)
		A	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb).	1wt% or less	Immediately prohibited	
		C	Lead contained in solders and soldering plate on substrates and electronic parts (ELV Directive)	—	—	2002/525/EC (ELV Directive)

OC. Sub-s tance No.	Substance Name (Substance Group Name) Illustrative List (listed or not?)	Rank	Applications and Applicable Conditions	Allowable Concentration (Threshold) (ppm or wt%)	Deadline for prohibition of its use in parts or materials (Note2)	Applicable Laws and Regulations
A 154	Lead and its compounds  * Listed in Illustrative List	C	Batteries	—	—	2002/525/EC (ELV Directive)
		C	Electronic parts with glass/ceramic substrates containing lead (e.g. resistive element, piezoelectric element, other than electric lamp)	—	—	
		C	Lead in the glass used for CRT, electronic parts and fluorescent lamps	—	—	
		C	Lead contained in electronic ceramic parts (e.g. piezoelectric element, dielectric materials and magnetic materials)	—	—	2002/95/EC (RoHS Directive)
		C	Lead contained in solder of servers, storage and storage array systems, and equipment for the network infrastructure for the management of transmission and communication	—	—	
		C	Lead contained in bearing shells and bearings made of lead bronze	—	—	
		C	Lead contained in compliant pin connector systems	—	—	
		C	Lead contained in the coating materials for thermal conduction module C rings	—	—	
		C	Lead contained in optical glass and filter glass	—	—	
		C	Lead contained in solder for ensuring the sustainable electric connection between the semiconductor die and the carrier in the integrated circuit "Flip Chip" package	—	—	
		C	Lead in linear incandescent lamps with silicate coated tubes	—	—	
		C	Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications	—	—	
		C	Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL)	—	—	
		C	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).	—	—	
		C	Lead in printing inks for the application of enamels on borosilicate glass	—	—	
		C	Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communications systems	—	—	
		C	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames	—	—	
		C	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitor	—	—	
		C	Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes	—	—	
		C	Lead oxide in the glass envelope of Black Light Blue (BLB) lamps	—	—	

OC. Sub-stance No.	Substance Name (Substance Group Name) Illustrative List (listed or not?)	Rank	Applications and Applicable Conditions	Allowable Concentration (Threshold) (ppm or wt%)	Deadline for prohibition of its use in parts or materials (Note2)	Applicable Laws and Regulations
A 154	Lead and its compounds * Listed in Illustrative List	C	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers	—	—	(Note 3) 2002/95/EC (RoHS Directive)
		C	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC	—	—	(Note 3)
A 155	Cadmium and its compounds * Listed in Illustrative List	A	Packing and packaging materials (corrugated cardboard boxes, boxes, bags, cushioning materials, tapes, etc.)	100ppm or less (Note1)	To be prohibited immediately in case of non-compliance with the conditions set forth in (Note 1).	94/62/EEC (Packaging Waste Directive) US Regulations on heavy metal on Packaging materials
		A	Batteries, accumulator	250ppm or less/unit cell	Immediately prohibited.	91/157/EEC (Directive on Batteries) Denmark: Regulations on Batteries.
		A	Stabilizers and pigment for plastics and rubber products, ink, paint, pigment, surface treatment (plating, coating)	Intentional addition prohibited and to be 100ppm or less	Immediately prohibited.	76/769/EEC (Marketing Restriction Directive), (Holland)
		A	Products (parts or materials) covered by ELV Directive (e.g. electrical contacts, fuse, paints, pigments, and stabilizers for plastics, thick film paste, resistive elements, protective glass of electronic parts)	Intentional addition prohibited and to be 100ppm or less	Immediately prohibited.	2002/525/EC (ELV Directive)
		A	Products (parts or materials) covered by RoHS Directive (e.g. glass and paint and pigment for glass, resistive elements, solder, fuse, etc.)	Intentional addition prohibited and to be 100ppm or less	Immediately prohibited	2002/95/EC (RoHS Directive)
		C	Electric contact and cadmium surface treatment (plating, coating) except for the applications prohibited by 76/769/EEC (e.g. Electric contacts on which high reliability is required)	—	—	(Note 3)
		C	Optical glass and filter glass	—	—	(Note 3)
		C	Printing inks for the application of enamels on borosilicate glass	—	—	(Note 3)
A 156	Hexavalent chromium and its compounds * Listed in Illustrative List	A	Packing and packaging materials (corrugated cardboard boxes, boxes, bags, cushioning materials, tapes, etc.)	100ppm or less (Note1)	To be prohibited immediately in case of non-compliance with the conditions set forth in (Note 1).	94/62/EEC (Packaging Waste Directive) US Regulations on heavy metal on packaging materials
		A	Products (parts or materials) covered by RoHS Directive, ELV Directive (e.g. rustproof treatment, paints, pigments, ink, catalysts, batteries and others)	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited	2002/95/EC (RoHS Directive) 2002/525/EC (ELV Directive)
A 157	Mercury and its compounds * Listed in Illustrative List	A	Packing and packaging materials (corrugated cardboard boxes, boxes, bags, cushioning materials, tapes, etc.)	100ppm or less (Note1)	To be prohibited immediately in case of non-compliance with the conditions set forth in (Note 1).	94/62/EEC (Packaging Waste Directive) US Regulations on heavy metal on packaging materials
		A	Batteries and accumulators	5ppm or less/unit cell	Immediately prohibited.	91/157/EEC (Directive on Batteries ) Denmark: Regulations on Batteries
		A	Water treatment for industrial use, business use and household use, and preservatives for wood	Intentional addition prohibited	Immediately prohibited.	76/769/EEC ( Marketing Restriction Directive), (Holland), and Germany's Chemical Prohibition Regulations
		A	Products (parts or materials) covered by ELV Directive (other than electrical discharge tube; e.g. paints, pigments, ink, and stabilizers, pigment and dyes for plastics, etc.)	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited.	2002/525/EC (ELV Directive)

OC. Sub-s tance No.	Substance Name (Substance Group Name) Illustrative List (listed or not?)	Rank	Applications and Applicable Conditions	Allowable Concentration (Threshold) (ppm or wt%)	Deadline for prohibition of its use in parts or materials (Note2)	Applicable Laws and Regulations
A 157	Mercury and its compounds  * Listed in Illustrative List	A	Products (parts or materials) covered by RoHS Directive (e.g. paints, pigments, ink, and stabilizers, pigment and dye for plastics)	Intentional addition prohibited and to be 1,000ppm or less	Immediately prohibited.	2002/95/EC (RoHS Directive)
		A	Small fluorescent tube	Mercury: 5mg or less/tube	Immediately prohibited.	
		A	Straight fluorescent tubes for general use containing halophosphates	Mercury: 10mg or less/tube	Immediately prohibited.	
		A	Straight fluorescent tubes for general use with ordinary life containing triphosphates	Mercury: 5mg or less/tube	Immediately prohibited.	
		A	Straight fluorescent tubes for general use with long life containing triphosphates	Mercury: 8mg or less/tube	Immediately prohibited.	
		C	Electrical discharge tube (Back light for liquid crystal instrument panel display)	—	—	2002/525/EC (ELV Directive)
		C	Straight fluorescent tubes for special use (e.g. High-pressure mercury lamp, etc.) and other lamps (e.g. Round fluorescent lamp, U-shaped fluorescent lamp, High-Intensity Discharge lamp).	—	—	2002/95/EC (RoHS Directive)

(Note 1) For packing and packaging materials, the total content of heavy metals (lead, cadmium, hexavalent chromium and mercury) shall be 100ppm or less.

(Note 2) The allowable concentration and the deadline for prohibition of its use in parts or materials are as set by Omron voluntarily. After the deadline, the delivery of non-compliant part or material shall be in principle shut off, provided, however, that if a part or material containing Substitution Substance is delivered after the deadline, such deadline shall be set on consultation with the Omron's department in charge.

(Note 3) Items indicated with (Note 3)(e.g. cadmium contact) are the items to which RoHS Directive is applied as the first priority (C rank). However, ELV Directive is applied to ELV-specific parts (models, specifications, etc.) (e.g. cadmium contact), and please write "ELV Directive is applied to such and such part (e.g. cadmium contact) and it is ranked A" in the supplier remark cell of the Rechts Registration Screen.

## 2. Non-use Substances (A1 rank)

- A1 rank includes substances about which regulations were formulated expressly and the deadlines for prohibition were stipulated, and, therefore schedule for non-use/prohibition has been accelerated by Omron. If these substances are used currently, the use should be discontinued by the abolition date by using substitutes or the like.
- Non-use substances are not specified as of November 2006. However, some substances may be designated in accordance with changes in laws and regulations.

### 3. Substitution Accelerating Substances (B rank)

- Substances that are currently (as of November, 2006) used and whose regulations are expected to be tightened further both in Japan and in foreign countries, so that the allowance may be reduced or the use may be prohibited. We have to study or promote the acceleration of substitution.

OC. Substance No. B rank	Substance Name (Substance Group Name)	Illustrative List (*=listed)	CAS No.	Another Names	Sample Application	Allowable Concentration (threshold) (ppm)	Applicable Laws and Regulations												Old OC. Sub- stance No..
							Ozone Layer Protection (Non-use Substance)	Chemical Examination (Class 1,2 Specified Substance)	Manufacture-prohibited Substances (Manufacture-prohibited Substances)	Poisonous/Delicious Substances (Poisonous/Delicious Substances)	Substances targeted by Waste Management Law (Special management substances)	Basel Domestic Law (Specified substances)	PRTR Law (Class 1,2 specified substances)	76/769/EEC (Use-prohibited substances)	Germany Chemical Prohibition (Prohibited substances)	Germany Daily Use Prohibition (Prohibited substances)	Prohibition of Use of Hazardous Substance (Prohibited substances)	Other legal regulation (examples) (i)94/62/EEC (Packaging Waste Directive) (ii)2002/525/EC (ELV) (iii)2002/95/EC (RoHS) (iv)US: Regulations on Heavy Metals in Packaging Materials kaging Materials	
013	Brominated flame retardants (except the specific brominated flame retardants such as PBB and PBDE)	*	—		Flame retardant for plastics, PCB, etc.	—												2002/96/EC (WEEE Directive) JGPSSI	New

#### 4. Self Control Substances (C rank)

- The substances whose use has not been prohibited by regulations home and abroad, but on which we are going to grasp the status of application and to reduce the consumption, recycle or treat appropriately.

OC. Substance No. C rank	Substance Name (Substance Group Name)	Illustrative List (*=listed)	CAS No.	Another Names	Sample Application	Allowable Concentration (threshold) (ppm)	Applicable Laws and Regulations													Old OC Sub- stance No..
							Ozone Layer Protection (Non-use Substance)	Chemical Examination (Class 1,2 Specified Substance)	Safety and Health (Manufacture-prohibited substance)	Substances (Poisonous/Deterious substances targeted by the law)	Waste Management Law (Special management substances)	Basel Domestic Law (Specified substances)	PRTR Law (Class 1,2 specified substances)	76/769/EEC (Use-prohibited substances)	Germany Chemical Prohibition (Prohibited substances)	Germany Daily Use Prohibition (Prohibited substances)	Holland Laws on Environmental Hazardous Substance (Prohibited substances)	Other legal regulation (examples) (i)94/62/EEC (Packaging Waste Directive) (ii)2002/525/EC (ELV) (iii)2002/95/EC (RoHS) (iv)US: Regulations on Heavy Metals in Packaging Materials		
010	Beryllium and its compounds	*	—		Alloys, ceramic, optical glass	—							x	S				JGPSSI	C-010	
014	Nickel		7440-02-0		Alloys, plating, batteries (Note) Such application as it keeps contact with human bodies are prohibited.	—								1	x		x	76/769/EC and (Holland) prohibited the applications where the substance keeps contact with human bodies.; JGPSSI	C-014	
015	Nickel compounds	*	—		Same as Nickel	—								S	x		x		C-015	
018	Arsenic and its compounds	*	—		Semiconductor, photoreceptor, glass (Note) The applications for water treatment and wood preservative are prohibited.	—					P	x	x	x	S	x	x	x	76/769/EC, (Holland) and German Chemical Prohibition Regulations prohibited the applications for water treatment and wood preservative.; JGPSSI	C-018
019	Selenium and its compounds	*	—		Semiconductor, pigment, catalyst	—					P	x		x	1			JGPSSI	C-019	
020	Antimony and its compounds	*	—		Flame retardant, pigment, alloy, resistive element	—					D			x	1			JGPSSI	C-020	
137	Bismuth and its compounds	*	—		Solder additives, fuses	—												JGPSSI	F-004	
141	Phthalate ester	*	—		Plasticizing agent	—								x	1	x	x	JGPSSI	Illustrative List	

## Attachment 3. Illustrative List of Regulated Chemical Substances

### 1. Prohibited Substances (A rank)

OC. Substance No.	Substance Group Name	Illustrative Substance No.	Illustrative Substance Name	CAS No.	Another Name	Metal Conversion Factor	Old OC. Substance No.
A-123	<b>Ozone layer depleting substances in the Montreal Protocol</b>						
	<b>Annex A Group I, II Substances</b>	01	CFC11	75-69-4	Trichlorofluoromethane		A-001
		02	CFC12	75-71-8	Dichlorodifluoromethane		A-002
		03	CFC113	76-13-1	Trichlorotrifluoroethane		A-003
		04	CFC114	1320-37-2	Dichlorotetrafluoroethane		A-004
		05	CFC115	76-15-3	Chloropentafluoroethane		A-005
		06	Halon1211	353-59-3	Bromochlorodifluoromethane		A-006
		07	Halon1301	75-63-8	Bromotrifluoromethane		A-007
		08	Halon2402	124-73-2	Dibromotetrafluoroethane		A-008
		09	R502(HCFC22+CFC115)	-			A-009
	<b>Annex B Group I Substances</b>	10	CFC13	75-72-9	Chlorotrifluoromethane		A-010
		11	CFC111	354-56-3	Pentachlorofluoroethane		A-011
		12	CFC112	28605-74-5	Tetrachlorodifluoroethane		A-012
		13	CFC211	135401-87-5	Heptachlorofluoropropane		A-013
		14	CFC212	3182-26-1	Hexachlorodifluoropropane		A-014
		15	CFC213	2354-06-5	Pentachlorotrifluoropropane		A-015
		16	CFC214	2268-46-4	Tetrachlorotetrafluoropropane		A-016
		17	CFC215	1652-81-9	Trichloropentafluoropropane		A-017
		18	CFC216	661-97-2	Dichlorohexafluoropropane		A-018
		19	CFC217	422-86-6	Chloroheptafluoropropane		A-019
	<b>Annex B Group II Substances</b>	20	Carbon tetrachloride	56-23-5	Tetrachloromethane		A-020
	<b>Annex B Group III Substances</b>	21	1,1,1-trichloroethane	71-55-6			A-021
	<b>Annex C Group I substances</b>	22	HCFC21	75-43-4	Dichlorofluoromethane		A-022
		23	HCFC22	75-45-6	Chlorodifluoromethane		A-023
		24	HCFC31	593-70-4	Chlorofluoromethane		A-024
		25	HCFC121	134237-32-4	Tetrachlorofluoromethane		A-025
		26	HCFC122	41834-16-6	Trichlorodifluoroethane		A-026
		27	HCFC123	306-83-2	2,2-dichloro-1,1,1-trifluoroethane		A-027
		28	HCFC124	2837-89-0	2-chloro-1,1,1,2-tetrafluoroethane		A-028
		29	HCFC131	134237-34-6	Trichlorofluoroethane		A-029
		30	HCFC132	25915-78-0	Dichlorodifluoroethane		A-030
		31	HCFC133	75-88-7	Chlorotrifluoroethane		A-031
		32	HCFC141	1717-00-6	1,1-dichloro-1-fluoroethane; HCFC-141b		A-032
		33	HCFC142	75-68-3	1-chloro-1,1-difluoroethane; HCFC-142b		A-033
		34	HCFC151	1615-75-4	Chlorofluoroethane		A-034
		35	HCFC221	134237-35-7	Hexachlorofluoropropane		A-035
		36	HCFC222	134237-36-8	Pentachlorodifluoropropane		A-036
		37	HCFC223	134237-37-9	Tetrachlorotrifluoropropane		A-037
		38	HCFC224	134237-38-0	Trichlorotetrafluoropropane		A-038
		39	HCFC225	-	Dichloropentafluoropropane		A-039
		40	HCFC226	134308-72-8	Chlorohexafluoropropane		A-040
		41	HCFC231	134190-48-0	Pentachlorofluoropropane		A-041
		42	HCFC232	134237-39-1	Tetrachlorodifluoropropane		A-042
		43	HCFC233	134237-40-4	Trichlorotrifluoropropane		A-043
		44	HCFC234	127564-83-4	Dichlorotetrafluoropropane		A-044
		45	HCFC235	134237-41-5	Chloropentafluoropropane		A-045
		46	HCFC241	134190-49-1	Tetrachlorofluoropropane		A-046
		47	HCFC242	134237-42-6	Trichlorodifluoropropane		A-047
		48	HCFC243	134237-43-7	Dichlorotrifluoropropane		A-048
		49	HCFC244	134190-50-4	Chlorotetrafluoropropane		A-049
		50	HCFC251	134190-51-5	Trichlorofluoropropane		A-050

OC. Sub-stance No.	Substance Group Name	Illustrative Substance No	Illustrative Substance Name	CAS No.	Another Name	Metal Conversion Factor	Old OC. Sub-stance No.
A-70		51	HCFC252	134190-52-6	Dichlorodifluoropropane		A-051
		52	HCFC253	134237-44-8	Chlorotrifluoropropane		A-052
		53	HCFC261	134237-45-9	Dichlorofluoropropane		A-053
		54	HCFC262	134190-53-7	Chlorodifluoropropane		A-054
		55	HCFC271	134190-54-8	Chlorofluoropropane		A-055
		56	TP5R(HCFC22+HCFC142+PFC218)	-			A-056
		57	TP5R2(HCFC22+PFC218)	-			A-057
	<b>Annex C Group II, III substances</b>	58	Bromodifluoromethane	1511-62-2	HBFC-22B1		
		59	Bromofluoromethane	373-52-4			
		60	Dibromofluoromethane	1868-53-7			
		61	Tetrabromofluoroethane	306-80-9			
		62	Tribromodifluoroethane	-			
		63	Dibromotrifluoroethane	354-04-1			
		64	Bromotetrafluoroethane	124-72-1			
		65	Tribromofluoroethane	-			
		66	Dibromodifluoroethane	75-82-1			
		67	Bromotrifluoroethane	421-06-7			
		68	Dibromofluoroethane	358-97-4			
		69	Bromodifluoroethane	-			
		70	Bromofluoroethane	762-49-2			
		71	Hexabromofluoropropane	-			
		72	Pentabromodifluoropropane	-			
		73	Tetrabromotrifluoropropane	-			
		74	Tribromotetrafluoropropane	-			
		75	Dibromopentafluoropropane	431-78-7			
		76	Bromohexafluoropropane	2252-79-1			
		77	Pentabromofluoropropane	-			
		78	Tetrabromodifluoropropane	-			
		79	Tribromotrifluoropropane				
		80	Dibromotetrafluoropropane	-			
		81	Bromopentafluoropropane	460-88-8			
		82	Tetrabromofluoropropane	-			
		83	Bromotetrafluoropropane	679-84-5			
		84	Dibromotrifluoropropane	70192-83-5			
		85	Tribromodifluoropropane	70192-80-2			
		86	Tribromofluoropropane	75372-14-4			
		87	Dibromodifluoropropane	460-25-3			
		88	Bromotrifluoropropane	421-46-5			
		89	Dibromofluoropropane	51584-26-0			
		90	Bromodifluoropropane	-			
		91	Bromofluoropropane	352-91-0			
		92	Bromochloromethane	74-97-5			
	<b>Annex E substances</b>	93	Methyl bromide	74-83-9	Bromomethane		
	<b>PCB (polychlorinated biphenyl) group</b>	01	Polychlorinated biphenyl	1336-36-3	PCB		A-070
		02	Polychlorinated terphenyl	61788-86-2	PCT		A-144
		03	Monomethyl dibromo diphenyl methane	99688-47-8	DBBT		A-145
		04	Monomethyl dichloro diphenyl methane	-	Ugilec 121, 21		A-146
		05	Monomethyltetrachlorodiphenylmethane	76253-60-6	Ugilec 141		A-147
		99	Other				

OC. Sub-stance No.	Substance Group Name	Illustrative Substance No	Illustrative Substance Name	CAS No.	Another Name	Metal Conver-sion Factor	Old OC. Sub-stance No.
A-128	<b>Specified organic tin compounds</b> (tributyl tin compounds, triphenyl tin compounds)  *The specified organic tin compounds do not include other organic tin compounds (diphenyl tin and dibutyl tin compounds, etc.) than tributyl tin and triphenyl tin compounds	01	Triphenyltin-N,N-dimethyldithicalbamate	1803-12-9		0.252	A-079
		02	Triphenyltin-floride	379-52-2		0.322	A-080
		03	Triphenyltin-acetate	900-95-8		0.290	A-081
		04	Triphenyltin-chloride	639-58-7		0.308	A-082
		05	Triphenyltinhydroxide	76-87-9		0.323	A-083
		06	Triphenyltin-chloroacetate	7094-94-2		0.268	A-085
		07	Triphenyltin-metacrylate	2155-70-6		0.316	A-086
		08	Bis(tributyltin)fumalate	6454-35-9		0.171	A-087
		09	Tributyltin-floride	1983-10-4		0.384	A-088
		10	Bis(tributyltin)-2,3-dibromosuccinate	31732-71-5		0.139	A-089
		11	Tributyltin-acetate	56-36-0		0.340	A-090
		12	Tributyltin-laurate	3090-36-6		0.243	A-091
		13	Bis(tributyltin)-phthalate	4782-29-0		0.160	A-092
		14	Tributyltin-sulfamate	6517-25-5		0.307	A-094
		15	Bis(tributyltin)-maleate	14275-57-1		0.171	A-095
		16	Tributyltinchloride(tributylchlorotin(IV))	1461-22-9		0.365	A-096
		17	Tributyltin-naphthenate	85409-17-2			A-097
		18	Tributyltin-1,2,3,4,4a,4b,5,6,10,10a-decahydro-7-isopropyl-1,4a-dimethyl-1-phenanthrenecarboxylate	26239-64-5		0.201	A-099
		99	Others				
A-105	<b>Asbestos</b>	01	Actinolite	77536-66-4			
		02	Amosite	12172-73-5			
		03	Anthophyllite	77536-67-5			
		04	Chrysotile	12001-29-5			
		05	Crocidolite	12001-28-4			
		06	Tremolite	77536-68-6			
		99	Others				
A-143	<b>Azo dyes &amp; pigments</b>	01	4-aminoazobenzene	60-09-3			
		02	Ortho-anisidine	90-04-0			D-006
		03	2-Naphthylamine (duplicate)	91-59-8	β-naphthylamine		A-108
		04	3,3'-dichlorobenzidine	91-94-1			
		05	Benzidine (duplicate)	92-87-5			A-103
		06	4-Aminobiphenyl (duplicate)	92-67-1			A-104
		07	Orth-toluidine	95-53-4			D-146
		08	4-Chloro-2-methylaniline	95-69-2			
		09	2,4-Toluenediamine	95-80-7			D-148
		10	Orth-aminoazotoluene	97-56-3			
		11	5-Nitro-o-toluidine	99-55-8			
		12	3-3'-Dichloro-4,4'-diaminodiphenylmethane	101-14-4			D-073
		13	4,4'-Methylenedianiline	101-77-9			
		14	4,4'-Diaminodiphenyl ether	101-80-4			
		15	p-chloroaniline	106-47-8			D-047
		16	3,3'-Dimethoxybenzidine	119-90-4	Dianisidine		
		17	3,3'-Dimethylbenzidine	119-93-7	Ortho-tolidine		
		18	2-Methoxy-5-methylaniline	120-71-8			
		19	2,4,5-Trimethylaniline	137-17-7			
		20	4,4'-Diaminodiphenylsulfide	139-65-1			
		21	2,4-Diaminoanisole	615-05-4			
		22	4,4'-Diamino-3,3'-dimethyldiphenylmethane	838-88-0			
A-151	<b>Radioactive substances</b>	01	Uranium	7440-61-1	U		
		02	Plutonium	-	Pu		
		03	Radon	-	Rn		
		04	Americium	-	Am		
		05	Thorium	7440-29-1	Th		
		06	Cesium	7440-46-2	Cs		
		07	Strontium	7440-24-6	Sr		
		99	Others				

OC. Sub-stance No.	Substance Group Name	Illustrative Substance No	Illustrative Substance Name	CAS No.	Another Name	Metal Conversion Factor	Old OC. Sub-stance No.
A-154	<b>Lead and its compounds</b>	01	Lead (II) chromate	7758-97-6		0.641	
		02	Lead (II) acetate	301-04-2		0.637	
		03	Lead (II) oxide	1317-36-8	Lead monoxide (II)	0.928	
		04	Lead (IV) oxide	1309-60-0	Lead dioxide (VI)	0.866	
		05	Trilead tetraoxide	1314-41-6		0.907	
		06	Lead hydroxide	1311-11-1		0.836	
		07	Lead (II) carbonate	598-63-0		0.775	
		08	Lead	7439-92-1		1.000	
		09	Lead (II) carbonate basic	1319-46-6		0.801	
		10	Lead stearate	1072-35-1		0.268	
		11	Lead titanate	12060-00-3		0.686	
		12	Dibasic lead stearate	56189-09-4		0.410	
		13	Lead sulfate	15739-80-7		1.000	
		14	Lead (II) zirconate	12060-01-4		0.600	
		15	Tribasic lead sulfate	12202-17-4		0.850	
		16	Lead (II) sulfide	1314-87-0		0.866	
		17	Lead (II) sulfate	7446-14-2		0.683	
		18	Lead (II) phosphate	7446-27-7		0.766	
		19	Lead hydroxycarbonate	1344-36-1		0.825	
		99	Others				
A-155	<b>Cadmium and its compounds</b>	01	Cadmium chloride (anhydride)	10108-64-2		0.613	
		02	Cadmium	7440-43-9		1.000	
		03	Cadmium oxide	1306-19-0		0.875	
		04	Cadmium nitrate (anhydride)	10325-94-7		0.475	
		05	Cadmium hydroxide	21041-95-2		0.768	
		06	Cadmium selenide	1306-24-7		0.587	
		07	Cadmium carbonate	513-78-0		0.652	
		08	Cadmium telluride	1306-25-8		0.468	
		09	Cadmium fluoride	7790-79-6		0.747	
		10	Cadmium sulfide	1306-23-6		0.778	
		11	Cadmium (II) sulfate (anhydride)	10124-36-4		0.539	
		12	Cadmium selenide sulfide	12214-12-9		0.670	
		99	Others				
A-156	<b>Hexavalent chromium and its compounds</b>	01	Potassium chromate	7789-00-6	Potassium chromate (VI)	0.268	
		02	Calcium chromate	13765-19-0	Calcium chromate (VI)	0.333	
		03	Strontium chromate	7789-06-2		0.255	
		04	Lead (II) chromate	7758-97-6		0.161	
		05	Barium chromate	10294-40-3		0.205	
		06	Chromic anhydride (V1)	1333-82-0	Chrome oxide	0.520	
		07	Potassium bichromate	7778-50-9	Potassium dichromate	0.354	
		08	Sodium bichromate	10588-01-9		0.397	
		09	Bichromic acid	13530-68-2		0.480	
		10	Copper chromate	12053-18-8		0.330	
		99	Others				
A-157	<b>Mercury and its compounds</b>	01	Mercury (II) chloride	7487-94-7		0.739	
		02	Mercury (II) oxide	21908-53-2		0.926	
		03	Mercury (I) oxide	15829-53-5		0.960	
		04	Dimethyl Mercury (II)	593-74-8		0.870	
		05	Mercury	7439-97-6		1.000	
		06	Mercury (I) chloride	10112-91-1		0.850	
		99	Others				

## 2. Substitution Accelerating Substance (B rank)

OC. Substance No.	Substance Group Name	Illustrative Substance No.	Illustrative Substance Name	CAS No.	Another Name	Metal Conversion Factor	Old OC. Substance No.
B-013	<b>Brominated flame retardants</b>	01	Poly(2,6-dibromophenyleneoxide)	69882-11-7			
		02	Tetra-decabromo-diphenoxy-benzene	58965-66-5			
		03	1,2,-bis(2,4,6-tribromophenoxy)benzene	37853-59-1			
		04	3,5,3',5'-tetrabromobisphenolA	79-94-7	TBBP-A		
		05	Tetrabromobisphenol-A (structure not specified)	30496-13-0			
		06	Tetrabromobisphenol-A (epichlorohydrin oligomer)	40039-93-8			
		07	Tetrabromobisphenol-A (TBBA-diglycidylether oligomer)	70682-74-5			
		08	Tetrabromobisphenol-A (carbonate oligomer)	28906-13-0			
		09	BC-52 tetrabromobisphenol-A	94334-64-2			
		10	BC-58 tetrabromobisphenol-A	71342-77-3			
		11	TBBA-bisphenol-a-phosgene polymer	32844-27-2			
		12	Brominated epoxy resin end-capped with tribromophenol	139638-58-7			
		13	Brominated epoxy resin end-capped with tribromophenol	135229-48-0			
		14	Tetrabromobisphenol-A-bis(2-hydroxyethyl ether)	4162-45-2			
		15	Tetrabromobisphenol-A-bis(allylether)	25327-89-3			
		16	Tetrabromobispheno-A-dimethylether	37853-61-5			
		17	Bis(4-hydroxy,3,5-dibromophenyl)sulfone	39635-79-5			
		18	Bis(3,5-dibromo-4-dibromopropoxyphenyl)sulfone	42757-55-1			
		19	2,4-Dibromophenol	615-58-7			
		20	2,4,6-Tribromophenol	118-79-6			
		21	Pentabromophenol	608-71-9			
		22	2,4,6-Tribromophenylallylether	3278-89-5			
		23	Mono(-Tetra)bromo(or chloro) phenylalkyl(C=2-8)(or allylglycidyl)ether	26762-91-4			
		24	1,2,5,6,9,10-hexabromocyclododecane	3194-55-6			
		25	Brominated or chlorinated cyclo(7-12-membered ring) hydrocarbons (Cl or Br: 4-12)	31454-48-5			
		26	1,2-dibromo-4-(1,2-dibromoehtyl)cyclohexan	3322-93-8			
		27	TBPA Na salt	25357-79-3			
		28	Tetrabromophthalic anhydride	632-79-1			
		29	Dimethyl tetrabromophthalate	55481-60-2			
		30	Dialkyl (C=6-23) tetrabromophthalate	26040-51-7			
		31	2-(2-hydroxyethoxy)ethyl-2-hydroxypropylt etrabromophthalate	20566-35-2			
		32	TBPA glycol-and propylene-oxide esters	75790-69-1			
		33	N,N'-ethylene bis-(tetrabromophthalimide)	32588-76-4			
		34	Ethylene-bis85,6-dibormo-norbornane-2,3-dicarboximide	52907-07-0			
		35	2,3-dibromo-2-butene-1,4-diol	3234-02-4			
		36	Dibromoneopentyl glycol	3296-90-0			
		37	2,3-dibromo propanol	96-13-9			
		38	Tribromo-neopentyl alcohol	36483-57-5			
		39	Polytribromostyrene	57137-10-7			
		40	Tribromostyrene	61368-34-1			
		41	Dibromostyrene grafted PP	171091-06-8			
		42	Polydibromostyrene	31780-26-4			
		43	Bromo/chlorostyrene	68955-41-9			
		44	Bromo/chloro- $\alpha$ -olefin	82600-56-4			
		45	Bromoethylene	593-60-2			
		46	Tris(2,3-dibromopropyl)isocyanurate	52434-90-9			
		47	Tris(2,4-dibromophenyl)phosphate	49690-63-3			
		48	Tris(tribromo-neopentyl)phosphate	19186-97-1			
		49	Chlorinated and brominated phosphate	125997-20-8			
		50	Pentabromoalkyl (C=1-2)benzene	87-83-2			

OC. Sub- stance No.	Substance Group Name	Illustrative Substance No	Illustrative Substance Name	CAS No.	Another Name	Metal Conver- sion Factor	Old OC. Sub- stance No.
B-013	<b>Brominated flame retardants</b>	51	Pentabromobenzylbromide	38521-51-6			
		52	1,3-Butadiene homopolymer brominated	68441-46-3			
		53	Perbromo(phenyl)methyl-acrylate	59447-55-1			
		54	Pentabromobenzylacrylate polymer	59447-57-3			
		55	Decabromodiphenylethane	61262-53-1			
		56	Tribromo-bisphenyl-maleinimide)	59789-51-4			
		57	Brominated trimethylphenyl-lindane)	59789-51-4			
		58	1,1,2,2-tetrabromoethane	79-27-6	Tetrabromoethane		
		59	Tris (2-Chloroethyl) phosphate	115-96-8	Tris (2-chloroethyl) phosphate		
		60	Hexabromobenzene	87-82-1	HBB		
		61	3-chloro-1,2-dibromopropan	96-12-8	DBCP		
		99	Other brominated flame retardants				

#### 4. Self Control Substance (C rank)

OC. Sub-stance No.	Substance Group Name	Illustrative Substance No	Illustrative Substance Name	CAS No.	Another Name	Metal Conversion Factor	Old OC. Sub-stance No.
C-010	<b>Beryllium and its compounds</b>	01	Beryllium	7440-41-7		1.000	
		02	Beryllium oxide	1304-56-9		0.360	
		99	Others				
C-015	<b>Nickel compounds</b>	01	Nickel (II) chloride	7718-54-9	Nickel dichloride	0.453	
		02	Nickel (II) oxide	1313-99-1		0.786	
		03	Anhydrous Nickel (II) carbonate	3333-67-3		0.495	
		04	Nickel (II) sulfate	7786-81-4		0.379	
		99	Others				
C-018	<b>Arsenic and its compounds</b>	01	Arsenic	7440-38-2		1.000	
		02	Gallium monoarsenide	1303-00-0	Garium arsenide	0.518	
		03	Diarsenic pentaoxide	1303-28-2	Pyroarsenic acid	0.652	
		04	Diarsenic trioxide	1327-53-3	Arsenous acid	0.757	
		99	Others				
C-019	<b>Selenium and its compounds</b>	01	Selenium	7782-49-2		1.000	
		02	Selenium dioxide	7446-08-4		0.712	
		03	Selenous acid	7783-00-8		0.612	
		99	Others				
C-020	<b>Antimony and its compounds</b>	01	Antimony	7440-36-0		1.000	
		02	Antimony (III) chloride	10025-91-9	Antimony trichloride	0.534	
		03	Antimony (V) chloride	7647-18-9	Antimony pentachloride	0.407	
		04	Antimony (III) oxide	1309-64-4	Antimony trioxide	0.836	
		05	Antimony (V) oxide	1314-60-9	Diantimony pentaoxide	0.753	
		06	Sodium antimonite	15432-85-6		0.632	
		99	Others				
C-137	<b>Bismuth and its compounds</b>	01	Bismuth	7440-69-9		1.000	
		02	Bismuth trioxide	1304-76-3		0.897	
		03	Bismuth nitrate	10361-44-1		0.431	
		99	Others				
C-141	<b>Phthalates</b>	01	Dibutyl phthalate	84-74-2	DBP		C-049
		02	Diisobutyl phthalate	84-69-5	DIBP		C-050
		03	Diheptyl phthalate	3648-21-3	DHP		C-051
		04	Diocetyl phthalate	117-84-0	DOP		C-052
		05	Bis(2-ethylhexyl) phthalate	117-81-7	Di-2-ethylhexyl phthalate, DEHP		C-053
		06	Butylbenzyl phthalate	85-68-7	BBP		C-054
		07	Diethyl phthalate	84-66-2	DEP		C-055
		08	Dipropyl phthalate	131-16-8	DprP		C-056
		09	Dicyclohexyl phthalate	84-61-7	DCHP		C-057
		10	Dipentyl phthalate	131-18-0	DPP		C-058
		11	Dihexyl phthalate	84-75-3			C-059
		99	Others				

## Attachment 4. Supplementary Material 1 (Statutory and Regulatory Reference Relating to Prohibited Substances)

### 1. Prohibited Substances

#### 1.1 Ozone layer depleting substances

- 1) Japan: "The Law Concerning The Protection of The Ozone Layer Through The Control of Specified Substances and Other Measures" (Ozone Layer Protection Law)
    - Montreal Protocol, Annex A-I, II: CFC11, CFC113, Halon 1211, Halon 1301, etc.
    - Montreal Protocol, Annex B-I: CFC13, CFC111, CFC112, CEC212, etc.
    - Montreal Protocol, Annex B-II&III: Carbon tetrachloride, 1,1,1-trichloroethane
    - Montreal Protocol, Annex C-I: HCFC21, HCFC22, HCFC141, HCFC225, etc.
    - Montreal Protocol, Annex C-II&III: Bromodifluoromethane, bromofluoromethane, etc.
    - Montreal Protocol, Annex E: Methyl bromide
    - \* Legal regulations: Prohibition of use: Montreal Protocol, Annex A-I, B-I&II, C-II&III  
Prohibition of consumption: Montreal Protocol, Annex C-I, E
  - 2) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance
    - Carbon tetrachloride, 1,1,1-trichloroethane
    - \* Legal regulations: Prohibited the use at the concentration exceeding 0.1wt%.
  - 3) United States: Clean Air Act
    - Class I: All the CFCs (CFCXXX), halon, carbon tetrachloride, 1,1,1-trichloroethane
    - Class II: All the HCFCs (HCFCXXX)
    - \* Legal regulations:
      - Labeling is mandate. Class I are in operation (Washing of manufacturing processes when any substances is contained in the products)
      - Class II is scheduled to come into operation on January 1, 2015.
- ⇒ Omron's Allowable Concentration (hereinafter referred to as "Allowable Concentration"):  
Some of Ozone layer depleting substances are allowed to be used in reduced amount or by labeling. However, Omron shall prohibit the washing of parts or materials with any of those ozone layer depleting substances.

#### 1.2 Specific brominated flame retardants

- 1) Japan: No legal regulation. ("Legal regulations" in this Attachment 4 means such regulations as prohibition of use and reduction of consumption.)
- 2) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance
  - \* Legal regulations: The use of PBB for the textile products such as clothes and underwear that get in touch with the skin is prohibited.
- 3) Germany's Chemical Substances Prohibition Law
  - PBB, PBD, PBBO, PBBE, PBDO, PBDE, and DBDPO are not covered by this law. However, it is likely to produce dioxins when burned, so that the intentional addition of those substances is prohibited.
- 4) Germany: Regulations on Articles for Daily Use
  - Legal regulations: Prohibited the use of PBB in textile products.
- 5) EU RoHS Directive
  - PBB, PBDE (provided that Deca-BDE is an exception.: as of 10/13/05)
  - \* Legal regulations: PBB and PBDE are allowed up to 0.1Wt% in uniform material

⇒ Allowable concentration:

We shall prohibit the intentional addition of the specific brominated flame retardants (PBBs and PBDES including Deca-BDE) in our parts or materials and shall not accept those containing any of them more than 1,000 ppm as an impurity.

### 1.3 PCB, etc.

- 1) Japan: Class 1 Specified Chemical Substances under the "Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances" (Chemical Examination Law)
  - \* Legal regulations: The use of PCB is prohibited (The main transformers and main rectifiers for railway cars are an exception.)
- 2) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance
  - PCB, PCT, monomethyldibromodiphenylmethane, monomethyldichlorodiphenylmethane, monomethyltetrachlorodiphenylmethane
  - \* Legal regulations: The marketing and use of the preparations or products containing any of the above substances are prohibited.
- 3) Germany: Chemical Substances Prohibition Law
  - PCB, PCT, monomethyldibromodiphenylmethane, monomethyldichlorodiphenylmethane, monomethyltetrachlorodiphenylmethane
  - \* Legal regulations: The marketing of preparations containing more than 50mg/kg of the aggregate of the above substances and products containing such preparations is prohibited.

⇒ Allowable concentration:

We shall prohibit the intentional addition of PCB, PCT, monomethyldibromodiphenylmethane, monomethyldichlorodiphenylmethane, and monomethyltetrachlorodiphenylmethane in our parts or materials, and shall not accept those containing more than 50 ppm of these substances as impurities.

### 1.4 Polychloronaphthalene (Cl: 3 or more)

- 1) Japan: Class 1 Specified Chemical substances under "Chemical Examination Law"
  - \* Legal regulations: The manufacture, import and use of the above-cited Class 1 Specified Chemical Substances are prohibited.

⇒ Allowable concentration:

We shall prohibit the intentional addition of the above substances in our parts or materials.

### 1.5 Specified organotin compounds (tributyltin compounds and triphenyltin compounds)

- 1) Japan: Class 2 Specified Chemical Substances under Chemical Examination Law
  - \* Legal Regulations: To comply with the technical guidelines for the manufacture, storage, and use of the above cited substances.
- 2) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance
  - \* Legal regulations: The use of organotin compounds in the substance or preparations as antifouling paints and biocides for the prevention of biologically fouling ship bottoms.

### 3) Germany: Chemical Substance Prohibition Law

- \* Legal regulations: The use of organotin compounds for antifouling coating on the ship bottoms and water treatment of industrial and business uses are prohibited.

⇒ Allowable concentration:

Although those specified organotin compounds are allowed to be used for some limited applications, there is a likelihood that they are regarded as an “environmental hormone”. Therefore, we shall prohibit the intentional addition of the specified organotin compounds in our parts or materials.

## 1.6 Asbestos

### 1) Japan: Manufacture-prohibited substances under “Industrial Safety and Health Law”

- Asbestos (amosite, crocidolite, chrysotile)
  - \* Legal regulations: Manufacture, import and use of the above substances are prohibited. Also, the manufacture, import and use of the products (adhesives, extruded cement products, etc.) containing more than 0.1wt% of asbestos other than amosite and crocidolite (e.g. chrysotile) are prohibited.

### 2) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance

- Asbestos (Amosite, Crocidolite, Anthophyllite, Actinolite, Tremolite and Chrysotile)
  - \* Legal regulations: The marketing and use of the above substances and the products to which any of the above substances is intentionally used are prohibited.

### 3) Germany: Chemical Substances Prohibition Law

- Asbestos (Amosite, Crocidolite, Anthophyllite, Actinolite, Tremolite and Chrysotile)
  - \* Legal regulations: The marketing of the above substances and the preparations containing more than 0.1wt% of the above substances on aggregate are prohibited.

⇒ Allowable concentration:

We shall prohibit the intentional addition of all the asbestos into our parts or materials, and shall not accept those containing more than 1,000ppm as impurities.

## 1.7 Chlorinated paraffin (carbon chain length: 10-13)

### 1) Japan: No regulation

### 2) EU 76/769/EEC (Marketing Restriction Directive)

- \* Legal regulations: It is prohibited that any substance or preparation put on the market contains chlorinated paraffin not less than 1wt%.

### 3) Germany: Chemical Substance Prohibition Law, and Holland: Laws on Environmental Hazardous Substance

- \* Legal regulations: The marketing of preparations containing chlorinated paraffin more than 1wt% is prohibited.

⇒ Allowable concentration:

We shall prohibit the intentional addition of them in our parts or materials, and shall not accept those containing chlorinated paraffin more than 10,000 ppm as an impurity.

**1.8 Azo dyes, pigment (22 substances including benzidine - for detail, see the attachment 3 “Illustrative List of Regulated Chemical Substances”)**

1) EU 76/769/EEC (Marketing Restriction Directive)

- \* Legal regulations: The use of azo dyes and pigments (22 substances), which emission rate exceeds 30ppm, in such textiles and leather products as is likely to contact the skin or mouth cavity directly and for long time is prohibited.

2) Germany: Articles for Daily Use

- \* Legal regulations: The manufacture, import and marketing of clothes and ornaments next to the skin that contain such azo dyes and pigments as produce any of 20 amines including benzidine but excluding 4-aminoazobenzene and 4-anisidine listed in the Illustrative List due to splitting of one or multiple azo groups are prohibited.

( Allowable concentration:

We shall prohibit their use where they contact human bodies continuously.  
If their release rates are more than 30ppm, such use is prohibited.

**1.9 Radioactive substances (Uranium, Plutonium, Radon, Americium, Thorium, Cesium, and Strontium)**

1) Japan: Nuclear substances under the “Law for the Regulations of Nuclear Source Material, Nuclear Fuel Material and Reactor”(Nuclear Substances Control Law)

- \* Legal regulations: The use of any of the above substances is subject to the approval of the Ministry of Education, Culture, Sports, Science and Technology.

( Allowable concentration:

We shall prohibit the use of the above substances in our parts or materials because they bring significant effects on human bodies.

**1.10 Polyvinyl chloride**

1) Japan and overseas: No regulation

( Allowable concentration:

As an Omron’s self-regulatory substance, we shall prohibit the use of PVC for packing and packaging since improper treatment in incineration would produce dioxins.

**1.11 Lead, cadmium, hexavalent chromium, and mercury**

1) Japan: No regulation

2) EU 94/62/EC (Packaging Waste Directive)

- \* Legal regulations: The total weight ratio of the above substances contained in packing and packaging materials must not exceed 100ppm.

3) United States: “Regulations on Heavy Metals in Packaging Materials”

- \* Legal regulations: The total weight ratio of the above substances contained in packing and packaging materials must not exceed 100ppm.

⇒ Allowable concentration:

The total weight ratio of the above substances contained in packing and packaging materials must be 100ppm or less.

### 1.12 Lead

- 1) Japan: No regulation.
  - 2) EU Battery Directive (91/157/EEC)
    - \* Legal regulations: The marketing of batteries and accumulators containing lead exceeding 0.4wt% per unit cell is prohibited, provided, however, that those which bear the marking of batteries and are easy to detach and whose instruction manuals carry how to detach may be marketed.
  - 3) Denmark's "Regulations on Batteries"
    - \* Legal regulations: The import and marketing of batteries containing lead exceeding 0.4wt% is prohibited, provided, however, that those which bear the marking of batteries and are easy to detach and whose instruction manuals carry how to detach may be marketed.
- ⇒ Allowable concentration:
- The content of lead per unit cell shall be 4,000ppm or less, but not limited when they bear the marking of batteries and are easy to detach.
- 1) EU 76/769/EEC (Marketing Restriction Directive); Germany: Chemical Substance Prohibition Law
    - \* Legal regulations: The use of lead in paints is prohibited.
  - 2) EU:2002/525/EC (ELV Directive), 2002/95/EC (RoHS Directive)
    - \* Legal regulations: With respect to lead as stabilizers for paints, inks, plastics and rubber and lead-containing PVC electric wires, the content up to 0.1wt% in uniform material is allowable.
- ⇒ Allowable concentration:
- We shall prohibit the intentional addition of lead for the use of paints, inks, stabilizers for plastics, and solder etc. Besides, the content of lead as an impurity shall be 1,000ppm or less.

### 1.13 Cadmium

- 1) Japan: No regulation.
  - 2) EU Batteries Directive (91/157/EEC)
    - \* Legal regulations: The marketing of batteries and accumulators containing cadmium more than 0.025wt% per unit cell is prohibited.
  - 3) Denmark's Regulations on Batteries
    - \* Legal regulations: The import and sale of batteries and accumulators containing cadmium more than 0.025wt% per unit cell is prohibited.
- ⇒ Allowable concentration:
- The content of cadmium in batteries and accumulators shall be 0.025wt% (250ppm) or less per unit cell.
- 1) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance, Germany: Chemical Substance Prohibition Law
    - \* Legal regulations: The marketing of resins, paints and PVC insulating materials containing cadmium above 0.01wt% is prohibited. The use of cadmium plating on the manufacturing machines of foods, for cooling or refrigeration, printing and book-binding, and articles for daily use, furniture, etc. is prohibited.

2) EU:2002/525/EC (ELV Directive), 2002/95/EC (RoHS Directive)

- \* Legal regulations: With respect to cadmium in paints, inks, stabilizers for plastics and rubber, and PVC electric wires, the allowable concentration is up to 0.01wt% in uniform material.

⇒ Allowable concentration:

We shall prohibit the intentional addition of cadmium for the use of stabilizers for plastics and/or rubber, and of pigments, inks, paints, surface treatment (plating, coating) etc. Besides, the content of cadmium as an impurity shall be 100ppm or less.

#### 1.14 Hexavalent chromium

1) Japan; No regulation

2) EU:2002/525/EC (ELV Directive), 2002/95/EC (RoHS Directive)

- \* Legal regulations: With respect to hexavalent chromium in paints, pigments, inks, catalysts and batteries, the allowable concentration of hexavalent chromium is up to 0.1wt% in uniform material.

⇒ Allowable concentration:

We shall prohibit the intentional addition of hexavalent chromium for the use of paints, pigments, inks, catalysts, batteries etc. Besides, the content of hexavalent chromium as an impurity shall be 1,000ppm or less.

#### 1.15 Mercury

1) Japan: No regulation.

2) EU Battery Directive (91/157/EEC)

- \* Legal regulations: The marketing of batteries and accumulators (both including those mounted with equipment or machines) containing mercury more than 0.0005wt% is prohibited, provided that button batteries and button cell batteries containing mercury not more than 2wt% are not covered by this prohibition.

3) Denmark's "Regulations on Batteries"

- \* Legal regulations: The import and marketing of batteries and accumulators (both including those mounted with equipment or machines) containing more than 0.0005wt% are prohibited, provided that button batteries and button cell batteries containing mercury 2wt% or less are not covered by this prohibition.

⇒ Allowable concentration: The allowable concentration of mercury shall be 5ppm or less.

1) EU 76/769/EEC (Marketing Restriction Directive), Holland: Laws on Environmental Hazardous Substance, and Germany: Chemical Substance Prohibition Law

- \* Legal regulations: The intentional addition of mercury for wood preservative, industrial textiles, and water treatment for industrial, business and home use is prohibited.

2) EU:2002/525/EC (ELV Directive), 2002/95/EC (RoHS Directive)

- \* Legal regulations: With respect to mercury in paints, pigments, inks and stabilizers and pigments for plastics, the allowable concentration of mercury is up to 0.1wt% in uniform material.

⇒ Allowable concentration:

We shall prohibit the intentional addition of mercury for the use of paints, pigments, inks, stabilizers & pigments for plastics etc. Besides, the content of mercury as an impurity shall be 1,000ppm or less.

## **Attachment 5.        Supplementary Material 2 (Analytical Methods for RoHS Directive Substances) -- As A Reference**

### **1. Lead, cadmium and their compounds**

#### **1) Screen analysis (X-Ray Fluorescent analysis)**

- (i) Perform a simple treatment of samples such as cutting or grinding as the pretreatment to obtain the necessary amount of sample for analysis, and set it to the analytical equipment, so that the analysis of whether lead or cadmium is “Contained” and the “Order Analysis” or semi-quantitative analysis (a method where content ratio is determined from a qualitative analysis) can be performed easily.
- (ii) This is suitable for the analysis of such materials as plastics, rubber, metals, glass, ceramics, etc.
- (iii) The content ratios of lead or cadmium is determined using the semi-quantitative analysis software and the quantitative analysis software (calibration curve method) that are built in the equipment.
- (iv) Employ Energy Dispersive X-Ray Fluorescent Analytical equipment.

#### **2) Quantitative analysis (ICP emission spectrophotography --Can determine the content ratio accurately)**

- (i) Subject the sample to wet decomposition (including pressurized decomposition) with sulfuric acid, nitric acid, hydrochloric acid, fluoric acid or hydrogen peroxide, or to decomposition by incineration in the presence of sulfuric acid, or decomposition by low-temperature ashing with oxygen plasma irradiation, to prepare a solution sample.
- (ii) When any precipitate is produced, redissolve the precipitant by fluoric acid decomposition or alkali fusion decomposition to solubilize it, and then perform the analysis.
- (iii) Set the prepared solution sample to ICP emission spectrophotometer, determine the concentration of lead or cadmium in the sample using the calibration curve separately prepared with a standard solution, and convert the content ratio of lead or cadmium in the solid sample.
- (iv) There is another method where a solid sample is directly set to the analytical equipment for frameless atomic absorption spectrometry that is capable of quantitative analysis.
- (v) ICP emission spectrophotometer (ICP-OEC), ICP mass spectroscope (ICP-MS) and atomic absorption spectrometer(AAS, FLAAS) are the standard analytical equipment.

### **2. Mercury and its compounds**

#### **1) Screen analysis (X-Ray Fluorescent analysis)**

- (i) Perform a simple treatment of samples such as cutting or grinding as the pretreatment to obtain the necessary amount of sample for analysis, and set it to the analytical equipment, so that the analysis of whether mercury is “Contained” and the “Order Analysis” or semi-quantitative analysis (a method where content ratio is determined from a qualitative analysis) can be performed easily.
- (ii) This is suitable for the analysis of such materials as plastics, rubber, metals, glass, ceramics, etc.
- (iii) The content ratios of mercury is determined using the semi-quantitative analysis software and the quantitative analysis software (calibration curve method) that are built in the equipment.
- (iv) Employ Energy Dispersive X-Ray Fluorescent Analytical equipment.

#### **2) Quantitative analysis (ICP emission spectrophotography --Can determine the content ratio accurately)**

- (i) Perform a pressurized decomposition or prepare a decomposition flask equipped with reflux condenser, and subject the sample to decomposition with sulfuric acid or nitric acid to make a solution sample taking care to avoid volatilization of mercury.
- (ii) Set the prepared sample solution to a reduced vaporization atomic absorption-photometer, determine the concentration of mercury in the sample using the calibration curve separately prepared with a standard solution, and convert the content ratio of mercury in the solid sample.
- (iii) Reduced vaporization ICP emission spectrophotometer (ICP-OES), reduced vaporization atomic absorption spectrometer (AAS, FLAAS) and ICP mass spectrometer (ICP-MS) are the standard analytical equipment.

### 3. Hexavalent chromium and its compounds

There are X-ray diffraction analysis and X-ray photoelectron spectroscopy for the analysis of whether any hexavalent chromium compound is contained in a solid sample, but it is unable to determine the content ratio of it by those methods. Therefore, the content ratio of chromium is measured by X-ray fluorescent analysis method tentatively, to check the possibility of existence of hexavalent chromium.

#### 1) Screen analysis (X-Ray Fluorescent analysis)

- (i) Perform a simple treatment of samples such as cutting or grinding as the pretreatment to obtain the necessary amount of sample for analysis, and set it to the analytical equipment, so that the analysis of whether chromium is "Contained" and the "Order Analysis" or semi-quantitative analysis can be performed easily.
- (ii) This is suitable for the analysis of such materials as plastics, rubber, metals, glass, ceramics, etc.
- (iii) The content ratios of chromium is determined using the semi-quantitative analysis software and the quantitative analysis software (calibration curve method) that are built in the equipment.
- (iv) Employ Energy Dispersive X-Ray Fluorescent Analytical equipment.

#### 2) Quantitative analysis (Absorptiometer, ion chromatograph analysis--Can determine the content ratio accurately)

- (i) Subject the sample to extraction by boiling water as the pretreatment, and analyze the extracted solution. Or, subject it to decomposition with alkali solution, and dilute it with ion-exchanged water to perform the analysis.
- (ii) Determine hexavalent chromium selectively using a diphenylpicazide absorptiometry or an ion chromatographic analysis.
- (iii) Determine the concentration of hexavalent chromium in the sample using the calibration curve separately prepared with a standard solution, and convert the content ratio of hexavalent chromium in the solid sample.
- (iv) Absorptiometer or ion chromatograph analytical equipment are the standard analytical equipment.

### 4. PBBs and PBDEs

#### 1) Quantitative analysis (high-resolution gas chromatograph mass analysis)

- (i) Freeze the sample as pretreatment, subject it to cryo-milling at a light-shielded place, and dissolve it with organic solvent to extract the substance.
- (ii) Add  $^{13}\text{C}^{12}$  internal standard to the sample solution, and analyze it with a high-resolution double-focusing mass spectrometer (HRGC/HRMS)
- (iii) High-resolution gas chromatograph mass spectrometer (HRGC/HRMS) is the standard analytical equipment.

## Attachment 6

To: Omron Corporation

### **Certificate of Non-inclusion for Regulated Substances**

**Company name :** \_\_\_\_\_

**Job description :** \_\_\_\_\_

**Signature :** \_\_\_\_\_

**Date :** \_\_\_\_\_

**Tel :** \_\_\_\_\_

Based on “Investigation Manual for the Regulated Chemical Substances Version 2.0” of Omron Corporation, we hereby certify that the chemical substances cited below are not contained in our products, parts or materials listed below (including accessories, packing/packaging materials, and other articles accompanying them) that are supplied for Omron Corporation (including its subsidiaries and affiliated companies) by the company (including its subsidiaries and affiliated companies):

1. Chemical substances not contained:

(1) Omron’s Prohibited Substances (A rank): 16 substance groups

\* For the name of a substance, refer to “Investigation Manual for the Regulated Chemical Substances Version 2.0”

2. Target products, parts or materials

	Product Number (no number: manufacturer's name)	Category Name	Catalog Number
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

\* If the form is not enough for listing, please add the separate paper for listing.

**Attachment 7**

To: Omron Corporation

**Declaration for Phase-out of Regulated Substances**

Company name: \_\_\_\_\_

Job description: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Tel: \_\_\_\_\_

We hereby pledge that we are committed to attaining the goal for phase-out of Non-use Substances contained in our products, parts or materials listed below (including accessories, packing/packaging materials, and other articles accompanying them) that are supplied the Omron Corporation (including its subsidiaries and affiliated companies) by the company (including its subsidiaries and affiliated companies) by the deadline listed below:

## 1. Omron's Non-use Substances (A 1 rank):

\* For A1 rank in each substance, refer to Attachment 2. of "Investigation Manual for the Regulated Chemical Substances".

## 2. Target products, parts or materials

	Product Number	Category Name	Catalog Number	Deadline for Non-use (MM/YYYY)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

\* If the form is not enough for listing, please add the separate paper for listing.

## Attachment 8

## PROCESS CHANGE REPORT(PCR)

OMRON

Date

No.

From (Company name)

TO

If it is a commercial product,  
enter its product number.

Written:

Checked:

Type	Part name	Parts code No.(drawing No.)	
Change classification <input type="checkbox"/> Change in manufacture place <input type="checkbox"/> change in manufacture method <input type="checkbox"/> Renewal or modification of die			
Reason		Effective date of change	
<ul style="list-style-type: none"> <li>· Change of material of a part or material</li> <li>· Change of material of an ink, paint and the like.</li> <li>· Includes the change of subsidiary materials (adhesives, solders, etc.)</li> </ul>		Lot No.	
		Change in QA standers	<input type="checkbox"/> QC process chart <input type="checkbox"/> Inspection standards <input type="checkbox"/> Representative sample
Present method		Method after change	
		<p>The attached materials contain the following:</p> <ul style="list-style-type: none"> <li>· Survey Form for the Regulated Chemical Substances</li> <li>· Results of evaluation of reliability</li> <li>· Results of evaluation of performances</li> </ul>	
		Quality check points & result	

Opinion & requirement	Checked:

For OMRON use

Indications for receiving inspection	indicator	Result of receiving inspection

Pro455 QE E

## Attachment 9

### Survey Form for the Regulated Chemical Substances (Sheet 1)

Reason for submission	<input checked="" type="radio"/> New part or material <input type="radio"/> Change of existing part or material
-----------------------	---

#### [Part Information]

Product Number <small>(English one byte characters)</small>	
Category Name	
Catalog Number	
Manufacturer	
Mass of Part or Material (g) <small>(English one byte characters)</small>	
Note	

(Note)  
If the target part or material is a cable, paint and the like, enter the mass per unit length or unit volume and note its unit in the "Note" column.

Omron's factory-in-charge		Site ID <small>(English one byte characters)</small>	
Section-in-charge		Survey form ver.	2006/11/1
Person-in-charge		Standard	Manual ver 2.0

#### [Supplier Information]

Date	
Company	
Supplier Code No. <small>(English one byte characters)</small>	
Section	
Person in charge	
TEL <small>(English one byte characters)</small>	
FAX <small>(English one byte characters)</small>	
E-mail <small>(English one byte characters)</small>	

	Survey Item	Answer	Remarks				
Q1	Whether any of Omron's defined Prohibited Substances (A) or Non-use Substances (A1) is "Contained" or "Not Contained"	<input type="radio"/> Contained → <table border="1"> <tr> <td><input type="checkbox"/> A substance "Contained"</td> <td>→Q3</td> </tr> <tr> <td><input type="checkbox"/> A1 substance "Contained"</td> <td>→Q2</td> </tr> </table> <input checked="" type="radio"/> Not Contained → Prepare the certification of "Not Contained"	<input type="checkbox"/> A substance "Contained"	→Q3	<input type="checkbox"/> A1 substance "Contained"	→Q2	*For the definition of "Contained", see Manual for Survey. *If A substance is contained, report it to Omron and exclude it promptly.
<input type="checkbox"/> A substance "Contained"	→Q3						
<input type="checkbox"/> A1 substance "Contained"	→Q2						
Q2	(If "A1 substance Contained" is the answer in Q1) Whether Non-use Plan has been established or not	<input type="radio"/> Have a plan → Deadline for phase out and substitution: <input type="text"/> year <input type="text"/> month → Complete the Commitment of Non-use and submit it to <input type="radio"/> No plan → Reason: <input type="text"/>	* If "Not Contained" is the answer in Q1, no need to answer here. If "Have a plan" is your answer in Q2, enter "the deadline for phase-out". If "Have a substitution" is your answer in Q3, enter "the deadline for completion of preparation for substitution". * If needed, you may be required to produce its detailed schedule.				
Q3	(If A substance is Contained in Q1, or no Non-use Plan in Q2), whether you have a substitute or not.	<input type="radio"/> Have a substitute → Type of substitute for non-use: <input type="text"/> <input type="radio"/> Have no substitute → Reason: <input type="text"/>	If "Have a plan" is your answer in Q2, enter the "Type of the part or material containing the Non-use Substance". If "Have a substitution" is your answer in Q3, enter the "Type of substitute part or material".				

## [ Part Information ]

Omron's factory-in-charge		Site ID	
Section-in-charge		Survey form ver.	2006/11/1
Person-in-charge		Standard	Manual ver 2.0

Supplier Information		Supplier Code No.	
Date			
Company			
Section			
Person in charge			
TEL			
FAX			
E-mail			

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**Survey Form for the Regulated Chemical  
Substances (Sheet 3)**

[Part Information]

Product Number	
Category Name	
Catalog Number	
Manufacturer	
Mass of Part or Material (g)	

Omron's factory-in-charge		Site ID	
Section-in-charge		Survey form ver.	Nov.1, 2006
Person-in-charge		Standard	Manual ver. 2.0

[Supplier Information]

Date	
Company	
Section	
Person in charge	
TEL	
FAX	
E-mail	

Please fill in the form with respect to the 25 substances specified in the Regulated Chemicals List attached as attachment 2 to Survey Manual (fill in cells that are not colored gray). There is no need to fill in the gray cells unless otherwise requested by Omron.

[Content of Regulated Chemical Substance]

Substance No.	Substance Name	Listed or not	No. in PRTR Law	CAS No	Whether "Contained or Not" "Contained"=1/"Not Contained"=blank	Content Ratio (ppm) (English one byte characters)	Part component	Purpose of Addition	Old Substance No.
A-154	Lead and its compounds	●	1-230	-					B-004
A-155	Cadmium and its compounds	●	1-060	-					B-002
A-156	Hexavalent chromium and its compounds	●	1-069	-					B-001
A-157	Mercury and its compounds	●	1-175	-					B-003
A-058	PBB (polybrominated biphenyls)			-					A-058~059
A-063	PBDE (polybrominated diphenylethers)			-					A-060~063,A-124
A-153	Polyvinyl chloride			9002-86-2					C-123
B-013	Brominated flame retardants	●		-					-
A-123	Ozone layer depleting substances	●		-					A-001~057
A-125	Dioxins	●	1-179	-					A-064~069
A-070	PCB (Polychlorobiphenyl) group	●	1-306	-					A-070
A-071	Polychloronaphthalene			70776-03-3					A-071
A-072	HCB (Hexachlorobenzene)			118-74-1					A-072
A-073	Aldrin			309-00-2					A-073
A-074	Dieldrin			60-57-1					A-074
A-075	Endrin			72-20-8					A-075

(This Survey Form for Sheet 3 comprises 6 sheets in total.)

**Attachment 10.**
**Q & A**

No.	Item	Question	Answer
1	Inquiry	When there arise any question, whom can we inquire of it?	For how to enter and the deadline for submission, please contact Omron's section-in-charge. For technical questions such as substitute technologies, measurement methods and analytical value, we are going to open a new corner for questions in our Website early December, 2003. Please pose your question to its corner for question.
2	Purpose	Does our answer on the hazardous substances affect the future business with Omron?	The purpose of this survey is to collect the basic information for Omron's compliance, and its goal is for Omron to comply with the relevant laws and regulations by substitution of parts and materials. We think it is necessary for both you and us to study further and improve the situation as a partner.
3	Purpose	Does your survey on the hazardous substances bring us any benefit?	The major purpose of this survey is to comply with the European environmental regulations. However, we think that the information on hazardous materials will be an important factor for our business relation in the coming future.
4	Purpose	Is there any penalty if we fail to follow your rules?	This is the fact-finding survey. There may possibly occur replacements with another substitute and trading halts in the future.
5	Purpose	Does the target regulated chemical substances mean the prohibition of their use?	We have classified them into Prohibited Substances, Non-use Substances and Self Control Substances and are going to manage them according to these categories. We will give priority to those substances with which the substitution of Prohibited Substances and Non-use Substances has been technologically established.
6	Survey	Do we not need to answer on our products supplied to Omron that are not covered by your parts list for this survey?	In principal not. However, if it is a substitute for Omron's specified part, please inform our person in charge to that effect and obtain the consent to it.
7	Survey unit	How far do we need to segment a part into part components for our investigation?	Please investigate the chemical substances subject to this survey for each part and each part or material composed of Omron's designated part components whose names are listed in Separate Volume; Detail Part Name. If you can't judge the segmentation, please contact the corner for question in our new Website.
8	Survey unit	We are supplying Omron with the parts such as motors and board units that are composed of a number of component parts. Do we need to answer on all the component parts and materials of them?	Please answer for each part and each part or material composed of the part components listed in Separate Volume; Detail Part Name. Note, however, that the content and content ratio on a part component basis should be entered in Sheet 2 as for the chemical substances included in RoHS Directive 6 substances and polyvinyl chloride and brominated flame retardants, and further that the aggregation of contents of each part component divided by the total weights of the part should be entered in the content ratio column of Sheet 3. In that case, answer on the part component used principally and its main purpose.
9	Target substances	We have the information on the similar type of the parts we are supplying Omron, but not enough on the parts for Omron. Do we need to investigate them?	This survey goes so far as to target such substances whose consumption is a very small quantity (around 0.1mg). To this end, please investigate substances of any different part and part or material, including such subsidiary materials as adhesives, if any.
10	Target subsidiary materials	Do we need to investigate such subsidiary materials as adhesives, screws and tapes?	Yes. For example, if you employ any subsidiary material not specified in the processing drawing, please give us the information on the substances "Contained" in the parts, including that of such subsidiary material.

No.	Item	Question	Answer
11	Target raw materials	How should we answer on such raw materials as molding compounds and metals?	In case of raw materials, leave the “content ratio” column and the “mass of part or material” column in Sheet 3 blank since the content ratio is calculated as the ratio on a unit weight basis. Example: For the content of lead in aluminum, enter the composition rate in its Inspection Certificate or the content ratio measured by you. Note that, if none of Non-use Substance is contained in the plating or other surface treatment, you need not enter anything in Sheet 2.
12	Residue subject to this survey	We put a chemical containing the regulated chemical substance in our manufacturing process, but remove it by washing. Do we need to inquire our supplier of its constituents?	If it is completely removed, no need to investigate further. However, if there is bare possibility of remaining, investigate it and answer the results.
13	Target trace constituent	As for “Cadmium and its compounds”, is the cadmium contained in silver solder subject to this survey? (JIS 23261 Bag-1)	As the constituents of the silver solder is attached to the part, it is subject to the survey as a subsidiary material “Contained” in the part. If you cannot figure out the amount remained on the part, answer the cadmium content in silver solder per investigation unit.
14	Packaging materials subject to this survey	Are the packing materials used for packing Omron’s products subject to the survey?	Those used for marketing the products are subject to this survey, but those used in delivering your products to Omron and recovered by you, such as returnable trays or boxes are not covered.
15	Packaging materials subject to this survey	Is the packing materials used in delivering the parts to you covered by this survey?	Not covered, provided, however, that those used as such in marketing Omron’s product are subject to this survey.
16	Content	We have obtained MSDS for the substances from our suppliers. Can we answer based on the data of MSDS?	MSDS does not carry the content of chemicals below 1 wt%. In this survey, you are required to answer the content ratio in the order of 0.0005wt% (5ppm) or so. Please inquire your supplier of it. Also, please investigate the subsidiary materials that are likely to remain on the parts or materials.
17	Content	With metals, can we answer the content based on the Inspection Certificate of the metal manufacturer?	Inspection Certificate issued by metal manufacturers (data of substances stipulated under JIS) don’t cover the target regulated chemical substances. The allowable concentrations (threshold) are also different from those required by this survey. Take a copy of this Survey Materials and inquire the metal manufacturer of it. Also, please investigate the subsidiary materials that are likely to remain on the parts or materials.
18	Content / Confidentiality	How can we answer base on the information supplied by an upstream supplier? If the content is confidential, how should we handle it?	This survey don’t request you to disclose the composition, but ask you if the regulated chemical substance is “Contained” or not for the purpose of compliance with legal regulations and environmental protection. Please limit your answer to the listed chemical substances. The contents of your answer are for the internal use of Omron only. In case that we are requested to publicize it from outside of the company, we may comply with the request in some cases, in which case we will never disclose the name of the company in question and the type of products supplied to us. Taking the above into account, we would request you to disclose the constituent. If a confidentiality agreement is necessary, please communicate with our section in charge.

No.	Item	Question	Answer
19	Content	We can't find the metal conversion rate. In what manner can we find it?	You will find the metal conversion factors given in Attachment 3 "Illustrative List of Regulated Chemical Substances". When the metal conversion factor of any metal compound is not included in the List, consult the Chemical Handbook or other references for its atomic mass, and then refer to 5.2 "Instructions for the Survey".
20	Content	We intentionally use the target regulated chemical substance, but it is difficult to find its content. How should we investigate and answer it?	First, investigate the intentionally used chemical substance and enter the value (maximum). If you can't find it, please perform its analysis for the value. If the column is left blank, we judge that it means no use of the regulated chemical substances. Please submit us the "Certificate of Non-inclusion for Regulated Substances" for Prohibited Substances and Non-use Substances.
21	Regulated chemical substances	We cannot find the illustrative substance.	With regard to the part or material in which any of the target chemical substances is "Contained", we request you to investigate them with your supplier in reference to Attachment 3 "Illustrative List", but you need not write down the name of the illustrative substance in the Survey Forms.
22	Analysis	We are ready to answer the results of analysis. Is there any specified analytical method on your side?	Although we have described the analytical methods of RoHS target 6 substances for your information, there is not limitation to analytical methods. However, if you perform an analysis, please employ an analytical method capable of determining the content in the order of the specified allowable concentration (threshold).
23	Entry	Is it necessary to perform the investigation to sub-sub-contractors, sub-sub-sub- contractors, and so on? Likewise, how should we enter the results of investigation in the Survey Forms?	Please perform the investigation to sub-sub-contractor, etc. in your own discretion. After aggregation of the results of investigation, enter them in the Survey Forms and return the filled form to us. We don't mind your disclosing our company name as the client for this survey in the process of investigation.
24	Entry	We are dealing in materials, and the contents of answer for all the parts are the same data. Do we need to enter the answer to the individual questions?	Even if the same contents, please enter them on a part basis. (If the column for answer remains blank, it is regarded as "Not Contained".) For materials, the answer should be made by content ratio.
25	Dis-tribution	We want to approach overseas suppliers in English and Chinese to follow the investigation. Do you have the survey manuals of English version and Chinese version?	The survey manuals of English version and Chinese version are posted in the Rechs of our Websites. Please inform your ID and password to the person-in-charge of <u>Parts Evaluation Group of Omron's OKAYAMA Office</u> , and download.
26	Response	We have collected the information for 80% of items to be answered, but not for 20%. Is it better for us to submit the response with the answers for 80% ?	Please return the completed forms for 100% in principle by the deadline. If the response is likely to be late for the deadline, please contact our section-in-charge.
27	Response	If we can't respond to this survey on the regulated chemical substances, what shall we do?	All suppliers are required to respond to this survey because it is the basic information for compliance with legal regulations. If you have any difficulty to answer, do not hesitate to inquire us of the specific problems for the questions and the answers.
28	Sub-stitution	We want to propose for substitution. In what part should we write down it?	For the schedule of substitution, first check "Have a substitute", and then put the (name and) type of the substitute in the column for information on the substitute in "Survey Form for the Regulated Chemical Substances (Sheet 1)".

No.	Item	Question	Answer
29	Substitution	Ours will be the type to be excluded, and we have proposed for a substitute to your company. Can we answer the question based on the substitute?	Since this survey aims principally to grasp the current status, please answer on the type to be excluded. For the substitute, please submit the electric file for new proposal to us.
30	Substitution	What do you, Omron, think about the difference in properties of the substance that is proposed as the one not containing the regulated chemical substances, for example, corrosion resistance?	As for the products in compliance with the European environmental regulations, you are kindly requested to use the separate electric file for the proposal for the substitution. In response to the proposal, we will consider on the adoption in the same manner as is the existing way of new parts.
31	Future outlook	Is it likely that the target regulated chemical substances will increase in number?	We will discuss it in view of the status of regulation and social situations. It is possible that the target regulated chemical substances will increase in number in the future.
32	Future outlook	Is there any effect of this survey on the terms of transaction?	As Omron has decided the corporate policy to make product development considering the European environmental regulations, there may possibly be the effect on the terms of transaction. We are going to discuss the substitution from now on taking into due consideration the proposals from the suppliers.

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