



# Standards Pertaining to Procurement Restrictions for the Inclusion of Chemical Substances in Products Ver. 8 (for Suppliers)

## Contents

1. Purpose .....	1
2. Scope of Application .....	1
3. Banned Substances .....	2-3
4. Conditionally Banned Substances .....	4-5
5. Managed Substances .....	6-8
5.1 Providing Information about Whether Substances are Contained	
5.2 Formats of Reports Made to Provide Information about Whether Substances are Contained	
5.3 Items for Which Reports Are Made to Provide Information about Whether Substances are Contained	
6. Calculation of Concentration .....	9
6.1 Banned Substances and Conditionally Banned Substances	
6.2 Managed Substances	
7. Request for Warranty Submission .....	10
8. Analysis Measurement .....	10
8.1 Banned Substances and Conditionally Banned Substances	
8.2 Managed Substances	
9. Exemption .....	10
10. Revision .....	10
Revision History .....	11
Appendix 1 .....	12-15
Appendix 2 .....	16

## 1. Purpose

NEC has internally and externally declared that it will give priority to the environmentally conscious products of companies that actively address environmental conservation by establishing the “GREEN PROCUREMENT GUIDELINES (FOR SUPPLIERS)” in August 2002.

Since then, the social environment surrounding environmentally conscious products has considerably changed. For example, restrictions on substances used in products have increased. Especially, the RoHS Directive\*<sup>1</sup> established by the European Commission basically restricts the use of specified substances in electrical and electronic products marketed in the European Union. In addition, the REACH Regulation\*<sup>2</sup> enforced in June 2007 made public candidate substances subject to authorization (SVHCs). How these substances are contained must be managed, and if a product contains more than a certain amount of the substances, the information necessary for safe use of the product shall be transmitted. Similar laws and regulations are established or scheduled to be established in other countries. Furthermore, products free from banned substances are also being demanded in Japan as customers’ requirement of green procurement.

NEC (hereafter including the NEC Group) is determined to conform to the domestic and international restrictions that pertain to product substances. Therefore, materials, parts and other products that NEC procures to make up NEC systems as well as electrical and electronic products are required to conform to such restrictions basically.

## 2. Scope of Application

Standards hereof basically cover all of the procured products that make up NEC products (electrical and electronic devices and systems) as well as the items (such as packaging materials) shipped with the NEC products.

---

### \*1: RoHS Directive:

Abbreviation of the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU).

This EU law prohibits the sales of electrical and electronic products containing specific heavy metals (lead, mercury, cadmium, hexavalent chromium) or bromine flame retardant (PBB and PBDE) in the EU market after July 1, 2006.

The Directive has added the phthalates (DEHP, BBP, DBP and DIBP) to the list of restricted substances.

### \*2: REACH Regulation:

Abbreviation of the Registration, Evaluation, Authorization and Restriction of Chemicals (1907/2006).

This EU law, which took effect in June 1, 2007, establishes a comprehensive system for registration, evaluation, authorization, and restriction of chemicals. Manufactures and importers that will market substances, preparations, and articles in the EU are obliged, for example, to evaluate and register the substances, register and report the substances in the articles, and provide information about the substances in the articles under certain conditions. The article substances for which content information must be provided are known as candidate substances subject to authorization, commonly called SVHCs, which will be made public in a stepwise manner.

### 3. Banned Substances

Banned substances are shown in Table 1. In principle, NEC does not procure products containing any of the “banned substances” in Table 1. NEC's suppliers are basically not allowed to use any of the “banned substances” in Table 1 in the products they sell to NEC. These requirements are concerned with product quality and if a product contains any of the “banned substances” in Table 1 without the consent of NEC, this will be regarded as a quality defect and the supplier shall assume liability for defect warranty as per the contract.

**Table 1 Banned Substances**

Classification	No.	Name of Substance Group	Key Applicable Law and Regulation
Banned Substance	1	Polychlorinated biphenyls (PCBs)	Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances) EU REACH (Annex XVII)
	2	Polychlorinated naphthalenes (more than 2 chlorine atoms)	Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances)
	3	Tributyl tin oxide (TBTO)	Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances) EU REACH (SVHC 2008/10/28)
	4	Shortchain chlorinated paraffins (C10-C13)	EU REACH (Annex XVII)
	5	Ozone depleting substances (specified in Montreal Protocol: Class I)	Law Concerning the Protection of the Ozone Layer through the Control of Specified Substances and Other Measures Montreal Protocol
	6	Asbestos	EU REACH (Annex XVII) Industrial Safety and Health Law (Prohibition of Manufacturing and Use)
	7	Polychlorinated terphenyls (PCTs)	EU REACH (Annex XVII)
	8	Dimethyl fumarate	Commission Decision 2009/251/EC
	9	Perfluorooctane sulfonate (PFOS) and its Salts	EU REACH (Annex XVII) Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances)
	10	Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)	Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances)
	11	Hexabromocyclododecane	Japan Law Concerning the Evaluation of Chemical Substances (Class I Specified Chemical Substances)

Conditionally Banned Substance	12	Cadmium/cadmium compounds	EU RoHS
	13	Lead/lead compounds	
	14	Mercury/mercury compounds	
	15	Chromium VI compounds	
	16	Polybrominated biphenyls (PBBs)	
	17	Polybrominated diphenyl ethers (PBDEs)	
	18	Nickel (scope: components that come into contact with the human body)	EU REACH (Annex XVII)
	19	Azocolourants and Azo dyes which form certain aromatic amines	
	20	Dibutyltin (DBT) compounds* <sup>1</sup>	
	21	Diocetyl tin (DOT) compounds* <sup>1</sup>	
	22	Tri-substituted organostannic compounds (tributyl tin compound, triphenyl tin compound)	
	23	Di(2-ethylhexyl) phthalate (DEHP)	EU RoHS 22nd July, 2019 enforcement
	24	Benzylbutylphthalate (BBP)	
	25	Dibutylphthalate (DBP)	
26	Diisobutyl phthalate (DIBP)		

#### 4. Conditionally Banned Substances

The restriction details of conditionally banned substances are shown in Table 2. Expiry dates of exemptions to the substance restriction requirements under the RoHS Directive as applied to NEC products are shown in Table 3. Examples and descriptions of the substances prohibited by the RoHS Directive are in “Appendix 1.”

Even impurities must not contain any more conditionally banned substances than the thresholds in Table 2. Unless otherwise specified, the values in Table 2 are regarded as the thresholds. If drawings, specifications or other documents regarding procured products include specific thresholds, those specifications are to be used. Note that the supplier has a responsibility to check and guarantee the content and concentration. If any of the products is found to contain more conditionally banned substances than the thresholds, this will be regarded as a quality defect and the supplier shall assume liability for defect warranty as per the contract.

**Table 2 Restrictions on Conditionally Banned Substances**

No.	Name of Substance Group		Major Application or Scope	Threshold, Note
12	Cadmium/cadmium compounds	a	All applications(based on RoHS Directive 2011/65/EU )	*1
		b	Batteries (based on EU Battery Directive 2013/56/EU)	*2
		c	Packaging materials (based on EU Packaging and Packaging Waste Directive 94/62/EC)	*3
13	Lead/lead compounds	a	All applications (based on RoHS Directive 2011/65/EU)	*1
		b	Packaging materials (based on EU Packaging and Packaging Waste Directive 94/62/EC)	*3
14	Mercury/mercury compounds	a	All applications (based on RoHS Directive 2011/65/EU)	*1
		b	Batteries (based on EU Battery Directive 2013/56/EU)	*2
		c	Packaging materials (based on EU Packaging and Packaging Waste Directive 94/62/EC)	*3
15	Chromium VI compounds (other than metallic chromium and alloy)	a	All applications (based on RoHS Directive 2011/65/EU)	*1
		b	Packaging materials (based on EU Packaging and Packaging Waste Directive 94/62/EC)	*3
16	Polybrominated biphenyls (PBBs)	a	All applications	*1
17	Polybrominated diphenyl ethers (PBDEs)	a	All applications	*1
18	Nickel (scope: components that come into contact with the human body)	a	Especially for components that come into persistent contact with the human body	Intentional addition prohibited
		b	All excluding the above are exempted.	-
19	Azocolourants and Azo dyes which form certain aromatic amines		Azo dyes can, under certain conditions, release some of the aromatic amines listed in Appendix 1. They may not be used in textile and leather articles that could come into direct and prolonged contact with the human skin or oral cavity.	*6
20	Dibutyltin (DBT) compounds		Based on EU REACH Regulation	*4
21	Diocetyl tin (DOT) compounds		Based on EU REACH Regulation	*4
22	Tri-substituted organostannic compounds (tributyl tin compound, triphenyl tin compound)		Based on EU REACH Regulation	*4

23	Di(2-ethylhexyl)phthalate (DEHP)	a	All applications	*1,*5
24	Benzylbutylphthalate (BBP)	a	All applications	*1,*5
25	Dibutylphthalate (DBP)	a	All applications	*1,*5
26	Diisobutyl phthalate (DIBP)	a	All applications	*1,*5

- \*1 : The threshold of cadmium is 100 ppm. The threshold of lead, mercury, chromium VI, PBB,PBDE, DEHP,BBP,DBP, or DIBP is 1000 ppm.  
: The applications not listed in Table 2 shall be based on the Annex to the RoHS Directive.
- \*2 : The threshold of cadmium is 20 ppm. The threshold of mercury is 5 ppm
- \*3 : The threshold of the total weight of cadmium, lead, mercury, and chromium VI is 100 ppm. The substances must not be added intentionally.
- \*4 : The threshold of the concentration of the tin element of an article with respect to the weight is 1000 ppm (0.1 wt %).
- \*5 : Conditionally banned substances for the supply of products to NEC is one year prior to the date of enforcement by the EU RoHS Directive. After 22 July 2018, only products below the threshold can be supplied.
- \*6 : 0.003wt% of the finished textile/leather product [Reporting Level: Material]

Table 3: Expiry dates of exemptions to the substance restriction requirements under the RoHS Directive as applied to NEC products

EU RoHS Annex III exemptions	EU RoHS ; date of applicability	NEC; date of applicability
7(b) : Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	July 21, 2016	In principle January 21, 2016 (time limit of delivery)

\* Table 3 lists only those exemptions that have been applied to NEC products. Please refer to Annex III and IV of the EU RoHS Directive for other exemptions to the restrictions requirements.

The deadline for delivery of products making use of exemptions to the restriction requirements to NEC is six months prior to the date of applicability as set by EU RoHS Directive.

Please ensure that you supply products to NEC that make use of alternative substances that are not restricted under the ROHS Directive no later than six months prior to the applicable legal exemption expiry date.

Please ensure that you comply with the NEC applicability date.

EU RoHS directive:

<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0065>

## **5. Managed Substances**

The supplier has a responsibility to check “managed substances” and provide content information about them.

Table 4 shows the relevant framework. The “managed substances” are substances defined by the framework in Table 4, excluding “banned substances” and “conditionally banned substances” specified in standards hereof. The “managed substances” are based on the “target substances under management” defined by the Joint Article Management Promotion-consortium (JAMP).<sup>\*3</sup> It is not prohibited to intentionally contain the “managed substances,” but whether they are contained and their concentrations must be determined and reported.

### **5.1 Providing Information about Whether Substances are Contained**

- Be sure to determine whether candidate substances subject to authorization (SVHCs)<sup>\*4</sup> are contained, and perform the following:
  - (1) Be sure to report the concentration if it is higher than 0.1 wt%.
  - (2) Report the concentration as far as the supplier has learned if it is lower than or equal to 0.1 wt%.
  - (3) When an SVHC is added, immediately determine whether the added substance is contained, and report the concentration as in (1) or (2) above.
- For substances other than the SVHCs, perform the following:
  - (1) Report the concentration as far as the supplier has learned.
  - (2) Immediately make a report if the supplier has obtained new content information.
- When no managed substances are contained or no content information is available, report that no managed substances are contained.

### **5.2 Formats of Reports Made to Provide Information about Whether Substances are Contained**

- Substances and preparations: Basically chemSHERPA-CI format, but it accepts other formats.
- Articles: Basically chemSHERPA-AI format, but it accepts other formats.

### **5.3 Items for Which Reports Are Made to Provide Information about Whether Substances are Contained**

- Items for which NEC requires information

If it is discovered that the concentration of a contained SVHC that has not been reported exceeds 0.1 wt%, NEC will ask the supplier to conduct a thorough investigation to determine the cause (this includes pursuit of liability).

**Table 4 Framework for Defining Managed Substances (as of April 2017)**

Regulations and Documents for Defining Specific Managed Substances	Remarks
EU CLP Regulation* <sup>5</sup> Annex VI Table 3.2 CMR – Cat 1, 2	Excluding banned substances and conditionally banned substances specified in standards thereof
EU REACH Regulation Annex XVII* <sup>6</sup> Substances to be restricted (excluding CLP Regulation Annex VI Table 3.2 CMR – Cat 1, 2)	
EU REACH Regulation Candidate substances subject to authorization (SVHCs)	
ESIS PBT* <sup>7</sup> (Fulfilled)	
IEC62474* <sup>8</sup>	

\*3: JAMP:

Abbreviation of Joint Article Management Promotion-consortium.

A voluntary group set up in September 2006 mainly for the purpose of promoting cross-industrial activities, based on the recognition that, to improve industrial competitiveness in Japan and elsewhere, it is essential to create and popularize a specific system for appropriately managing information on the chemical substances contained in articles and smoothly disclosing and transmitting it in the supply chain, by 17 founder companies, all of whom subscribe to this principle. The schemes chemSHERPA-CI/chemSHERPA-AI as well as MSDSplus/AIS have been operated by JAMP since April, 2016. (The secretariat is the Japan Environmental Management Association for Industry (JEMAI).)

URL: <http://www.jamp-info.com/english> (as of April 2017)

\*4: Candidate substances subject to authorization (SVHCs):

Selected from the substances of very high concern that are identified with the procedure in Article 59 of the REACH Regulation and have the characteristics specified in Article 57 of the regulation. As of April 2017, there are 173 substances made public, and more substances will be added in a stepwise manner. Article 33 of the regulation stipulates that if the concentration of any of the SVHCs contained in a product exceeds 0.1 wt% with respect to the article weight and the product will be marketed within the EU, the supplier is obligated to provide the user with the information necessary for safe use of the product.

\*5: EU CLP Regulation:

EU regulation relating to the classification, labeling, and packaging of chemicals, which took effect in January 20, 2009. In Annex VI Table 3.2, carcinogenic (C), mutagenic (M), and reprotoxic (R) substances are classified as Cat 1, 2.

To be in harmony with the UN system (GHS) for the classification and packaging of chemicals, the CLP Regulation will incorporate 1) directive (67/548/EEC) relating to the classification, packaging, and labeling of hazardous substances and 2) directive (1999/45/EC) relating to the classification, packaging, and labeling of hazardous preparations in a stepwise manner; the directives in 1) and 2) were done away with in June 1, 2015.

\*6: REACH Regulation Annex XVII:

Substances are listed of which the marketing and use are restricted in the EU. These substances were listed in Annex I to the EU Council Directive (76/769/EEC) relating to restrictions on the marketing and



use of hazardous substances and preparations; the list was moved to the REACH Regulation in June 1, 2009, and now included in Annex XVII to the regulation. The substances listed in the Annex VI Table 3.2 (CMR Cat 1, 2) of the CLP Regulation have been excluded from Annex XVII to the REACH Regulation.

\*7: ESIS PBT:

Persistent, bioaccumulative, and toxic (PBT) substances that are made public in the European chemical Substances Information System and fulfill the conditions specified in Article 57 of the REACH Regulation. The substances will be treated as SVHCs in the future.

\*8: IEC62474:

IEC62474: Abbreviation of International Electro technical Commission 62474

IEC 62474 is a material declaration standard for products of and for the electrotechnical industry, published in March 2012. IEC 62474 Validation Team updates the IEC database, which was taken over from JIG.

URL : <http://std.iec.ch/iec62474/iec62474.nsf/MainFrameset> (as of April 2017)

## **6. Calculation of Concentration**

### **6.1 Banned Substances and Conditionally Banned Substances**

In the RoHS directive, the concentration is calculated per “part.” The concentration should be lower than the threshold in every part of the product. The part refers to the homogeneous block that cannot be further divided. For part examples, refer to “Appendix 2.”

The denominator for concentration calculation is the “part’s mass.” The numerator for concentration calculation is the “mass of banned substance in that part.” In the case of metallic compounds, convert the value into the net weight of the metallic element. (Example: The molecular weight of cadmium chloride ( $\text{CdCl}_2$ ) is 183 and that of cadmium is 114. So, cadmium accounts for 62% of cadmium chloride. Hence, if the part contains 1 g. of cadmium chloride, the weight of cadmium would be 0.62 g.)

### **6.2 Managed Substances**

The concentration is calculated on the basis of the individual laws and regulations in the framework in Table 4 and the industry standard. Caution must be exercised in the SVHCs specified in the REACH Regulation. Article 33 of the regulation stipulates that the concentration of any of the SVHCs contained in an article exceeds 0.1 wt%, the supplier of the article is obliged to provide enough information for the recipient of the article to use it safely. The denominator for calculation of the concentration, by which to determine whether the information should be provided, is not the homogeneous block defined in the RoHS Directive, but the mass of each article. When the Products are exported to the EU together with packaging materials such as boxes, the packaging materials are treated as individual items and the concentrations of the substances in them are controlled. For other packaging materials, information about the chemical substances contained in them need not be provided.

\*9: Article:

Under REACH, “Article” means “an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition”.

## **7. Request for Warranty Submission**

NEC may require the supplier to submit a warranty to prove that none of the products contain any more “banned substances” and “conditionally banned substances” than the thresholds. The submitted warranty should be approved by the supplier’s representative. Even if a warranty is not submitted, the supplier is not excused from liability for defect warranty.

NEC does not require the supplier to submit a warranty to prove that none of the products contain any more managed substances than the thresholds.

## **8. Analysis Measurement**

### **8.1 Banned Substances and Conditionally Banned Substances**

NEC may perform acceptance test against procured products to analyze and measure the restricted substances and substance groups. NEC can also request analysis and measurement from the supplier. If the analysis result (including the analysis result obtained by NEC's customer) proves that the product contains any more banned substances than the thresholds, NEC will ask the supplier to conduct a thorough investigation to determine the cause (this includes pursuit of liability for defect warranty).

### **8.2 Managed Substances**

NEC basically does not require the supplier to analyze and measure the “managed substances.”

## **9. Exemption**

Standards hereof do not apply when NEC agrees on the exemption in writing and so on, or if drawings, specifications or other documents clarify the exemption.

## **10. Revision**

The modifications made to standards hereof are posted on the NEC Website (NEC Partners Site). Standards hereof are subject to change without prior notice. Confirm with the ordering department.

## **[Revision History]**

### **\*Revision to Ver. 2** (December 2004)

- Full-fledged revision to ban more substances. In line with this revision, the title was changed from “Standards for Procurement Restriction on Substances Prohibited by the RoHS Directive” to “Standards Pertaining to Procurement Restrictions for the Inclusion of Chemical Substances in Products.”

### **\*Revision to Ver. 3** (July 2008)

- Minor amendment to sentences in Article 1 and 2.
- Amendment to Battery Directive in Table 2.

### **\*Revision to Ver. 4** (April 2010)

- Full-fledged revision to include the description of “managed substances.”
- Revision of Table 1, “Banned Substances.”
- Addition of Table 4, “Framework for Defining Managed Substances.”

### **\*Revision to Ver. 5** (February 2014)

- Revision of Table 1, “Banned Substances.”
- Revision of Appendix 1, “Conditionally Banned Substance.”

### **\*Revision to Ver. 6** (January 2015)

- Addition of Table 3, “Expiry dates of exemptions to the substance restriction requirements under the RoHS Directive as applied to NEC products.”

### **\*Revision to Ver. 6.1** (February 2015)

- Correction of errors

### **\*Revision to Ver. 7** (June 2016)

- Revision of Table 1, “Polychlorinated naphthalenes (more than 2 chlorine atoms)”
- Addition of Table 1 and 2, “DEHP, DBP, BBP, DIBP.”

Conditionally banned substances for the supply of products to NEC is one year prior to the date of enforcement by the EU RoHS Directive. After 22 July 2018, only products below the threshold can be supplied.

### **\*Revision to Ver. 8** (April 2017)

- Revision of Table 1 and 2, “Tri-substituted organostannic compounds (tributyltin compound, triphenyltin compound)”
- Revision of Table 2, “Azocolourants and Azo dyes which form certain aromatic amines”  
Application, scope and threshold are changed.
- Revision of Appendix 1, “Conditionally Banned Substance.”
- 5.2 Survey format is changed to chemSHERPA-CI/chemSHERPA-AI from MSDSplus/AIS.
- 6.2 The report mass of the containing management substance is changed.

**[Appendix 1] Conditionally Banned Substance**

The following list shows exemplified materials of the chemical compound which are in conformity with IEC62474 as of April 2017. Please note that the covered chemical substance may exist even though there is no description on it.

**Table Cadmium/Cadmium Compounds**

Name	CAS No.
Cadmium	7440-43-9
Cadmium oxide	1306-19-0
Cadmium sulfide	1306-23-6
Cadmium chloride	10108-64-2
Cadmium sulfate	10124-36-4 31119-53-6

**Table Lead/Lead Compounds**

Name	CAS No.
Lead	7439-92-1
Lead (II) sulfate	7446-14-2
Lead (II) carbonate	598-63-0
Lead hydrocarbonate	1319-46-6
Lead (II) acetate, trihydrate	6080-56-4
Lead phosphate	7446-27-7
Lead selenide	12069-00-0
Lead (IV) oxide	1309-60-0
Lead (II,IV) oxide	1314-41-6
Lead (II) sulfide	1314-87-0
Lead (II) oxide	1317-36-8
Lead (II) carbonate basic	1319-46-6
Lead (II) phosphate	7446-27-7
Lead (II) titanate	12060-00-3
Lead sulfate, sulphuric acid, lead salt	15739-80-7
Lead sulphate, tribasic	12202-17-4
Lead stearate	1072-35-1
Lead (II) chromate	7758-97-6
Lead chromate molybdate sulphate red	12656-85-8
Lead sulfochromate yellow	1344-37-2
Lead perchlorate	13637-76-8

Table Mercury/Mercury Compounds

Name	CAS No.
Mercury	7439-97-6
Mercuric chloride	33631-63-9
Mercury (II) chloride	7487-94-7
Mercuric sulfate	7783-35-9
Mercuric nitrate	10045-94-0
Mercuric (II) oxide	21908-53-2
Mercuric sulfide	1344-48-5
Perchloric acid, mercury(2+) salt	7616-83-3

Table Chromium VI Compounds

Name	CAS No.
Barium chromate	10294-40-3
Calcium chromate	13765-19-0
Sodium chromate	7775-11-3
Sodium dichromate	10588-01-9 7789-12-0
Strontium chromate	7789-06-2
Potassium dichromate	7778-50-9
Potassium chromate	7789-00-6
Zinc chromate	13530-65-9

Table Polybrominated Biphenyls (PBBs)

Name	CAS No.
Polybrominated Biphenyls	59536-65-1
Dibromobiphenyl	92-86-4
2-Bromobiphenyl	2052-07-5
3-Bromobiphenyl	2113-57-7
4-Bromobiphenyl	92-66-0
Tribromobiphenyl	59080-34-1
Tetrabromobiphenyl	40088-45-7
Pentabromobiphenyl	56307-79-0
Hexabromobiphenyl	59080-40-9
hexabromo-1,1-biphenyl	36355-01-8
Firemaster FF-1	67774-32-7
Heptabromobiphenyl	35194-78-6
Octabromobiphenyl	61288-13-9
Nonabiphenyl	27753-52-2
Decabromobiphenyl	13654-09-6

Table Polybrominated Diphenyl Ethers (PBDEs)

Name	CAS No.
Bromodiphenyl ether	101-55-3
Dibromodiphenyl ethers	2050-47-7
Tribromodiphenyl ether	49690-94-0
Tetrabromodiphenyl ethers	40088-47-9
Pentabromodiphenyl ether	32534-81-9
Hexabromodiphenyl ether	36483-60-0
Heptabromodiphenylether	68928-80-3
Octabromodiphenyl ether	32536-52-0
Nonabromodiphenyl ether	63936-56-1
Decabromodiphenyl ether	1163-19-5

Table Azocolorants and Azo dyes Which Form Certain Aromatic Amines

Name	CAS No.
Biphenyl-4-ylamine	92-67-1
Benzidine	92-87-5
4-chloro-o-toluidine	95-69-2
2-naphthylamine	91-59-8
o-aminoazotoluene	97-56-3
5-nitro-o-toluidine	99-55-8
4-chloroaniline	106-47-8
4-methoxy-m-phenylenediamine	615-05-4
4,4'-methylenedianiline	101-77-9
3,3'-dichlorobenzidine	91-94-1
3,3'-dimethoxybenzidine	119-90-4
3,3'-dimethylbenzidine	119-93-7
4,4'-methylenedi-o-toluidine	838-88-0
6-methoxy-m-toluidine	120-71-8
4,4'-methylene-bis(2-chloroaniline)	101-14-4
4,4'-oxydianiline	101-80-4
4,4'-thiodianiline	139-65-1
o-toluidine	95-53-4
4-methyl-m-phenylenediamine	95-80-7
2,4,5-trimethylaniline	137-17-7
o-anisidine	90-04-0
4-amino azobenzene	60-09-3

**Table: Tri-substituted organostannic compounds**

Name	CAS No.
Triphenyltin-N, N-dimethyldithiocarbamate	1803-12-9
Triphenyltin fluoride	379-52-2
Triphenyltin acetate	900-95-8
Triphenyltin chloride	639-58-7
Triphenyltin hydroxide	76-87-9
Triphenyltin fatty acid ((9-11) salt	18380-71-7 18380-72-8 47672-31-1 94850-90-5
Triphenyltin chloroacetate	7094-94-2
Tributyltin methacrylate	2155-70-6
Bis (tributyltin) fumalate	6454-35-9
Tributyltin fluoride	1983-10-4
Bis (tributyltin)2,3-dibromosuccinate	31732-71-5
Tributyltin acetate	56-36-0
Tributyltin laurate	3090-36-6
Bis (tributyltin) phthalate	4782-29-0
Copolymer of alkyl (c=8) acrylate, methyl methacrylate and tributyltin methacrylate	67772-01-4
Tributyltin sulfamate	6517-25-5
Bis (tributyltin) maleate	14275-57-1
Tributyltin chloride	1461-22- 97342-38-3
Tributyltin cyclopentane carbonate=mixture	85409-17-2
Tributyltin-1, 2,3,4,4a, 4b, 5,6,10,10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-	26239-64-5
Other tri-substituted organostannic compounds	—

**Table Dibutyltin (DBT) compounds**

Name	CAS No.
Dibutyltin oxide	818-08-6
Dibutyltin diacetate	1067-33-0
Dibutyltin dilaurate	77-58-7
Dibutyltin maleate	78-04-6
Other dibutyltin compounds	—

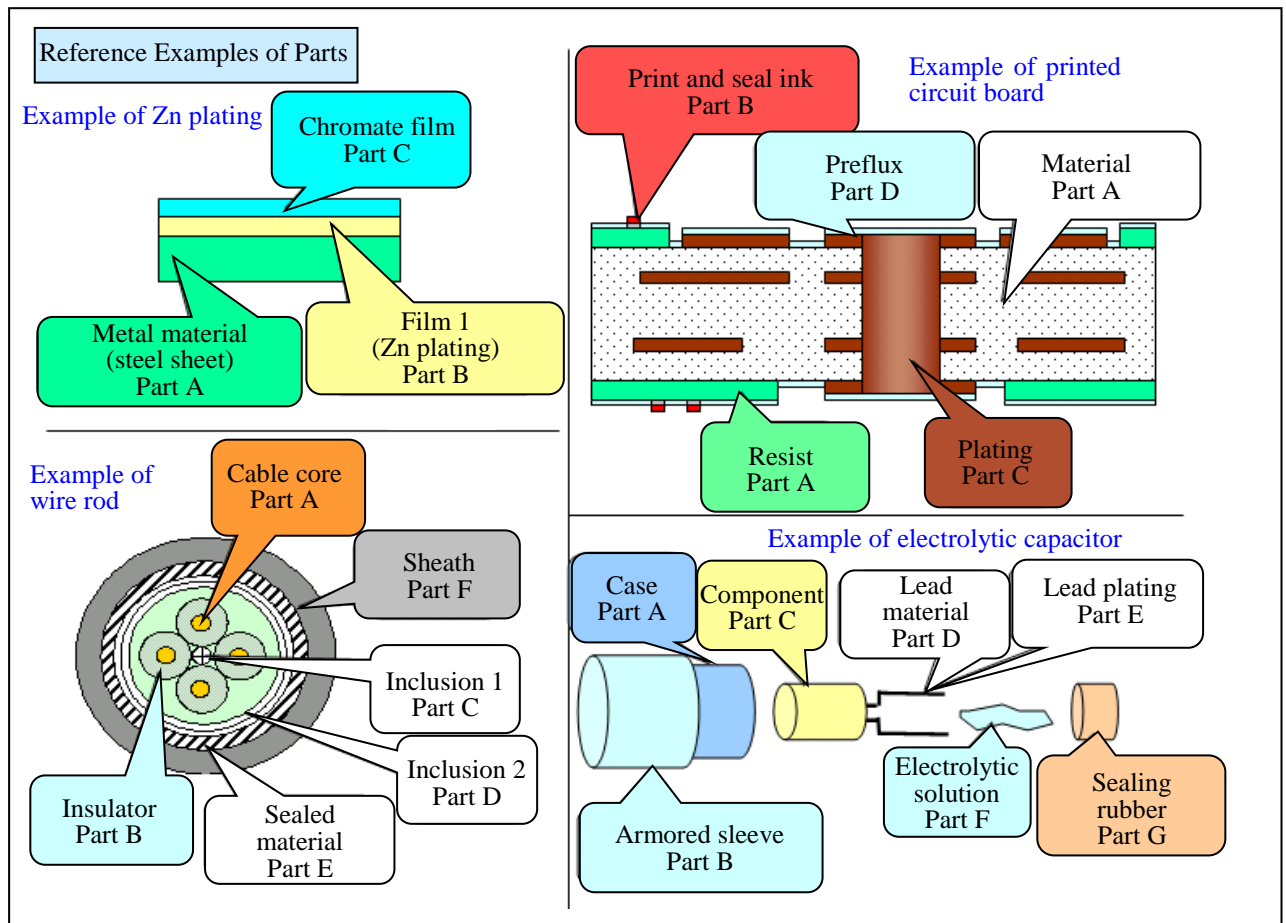
**Table Dioctyltin (DOT) compounds**

Name	CAS No.
Dioctyl Tin Oxide	870-08-6
Dioctyltin dilaurate	3648-18-8
Other Dioctyltin compounds	—

(End of Appendix 1)



[Appendix 2] Parts Examples



(End of Appendix 2)