

THE NEW VALUE FRONTIER



# **Kyocera Guideline on Environmentally Hazardous Substances (Brochure for Business Partners)**

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This guideline explains the Kyocera group's basic criteria for green procurement. A guideline issued by the group company takes priority when it is separately available.

Additional instructions issued by any Kyocera Corporation business unit should be followed in addition to this guideline.

## Preface

Since its foundation, Kyocera has carried out activities based on its corporate motto “Respect the Divine and Love People” and its management rationale “Contribute to the Advancement of Society and Humankind While Pursuing the Material and Spiritual Happiness of All Employees.”

Adhering to this management philosophy, Kyocera and its domestic and foreign affiliates have promoted the development and commercialization of solar cells and other products that contribute to global environmental preservation. Additionally, the Kyocera group has undertaken other active efforts for environmental preservation, including environmental management at its plants to reduce damage to the natural environment and adverse influences on the ecosystem.

In August 1998, Kyocera commenced efforts on the framework of its green procurement, which involves the selection of products to be procured on the basis of consideration of environmental issues. This move was due to our judgment that in order to reduce the environmental impact associated with our products, we needed to reduce such impacts attributed to parts built into the products, as well as materials procured by us. In December of the same year, we published our Guideline on Green Procurement, which outlines our approach to green procurement, our related requests to suppliers, and other relevant matters. Based on the Guideline, we have been successfully carrying out green procurement activities, thanks to the understanding and cooperation of our business partners.

We have divided our conventional “Kyocera Green Procurement Guideline” into two and established guidelines “Kyocera Guideline on Environmentally Hazardous Substances” that specifies the standards for product specifications for promoting green procurement and “Kyocera Guideline on Environmental Protection Activities (for Partners)” that describes the guiding principles for Kyocera’s idea of environmental protection activities.

Nowadays, legal regulations on environmental affairs as well as growing public demand for environmental protection have been more and more strengthened. We need cooperation of our business partners for complying with their requirements.

Accordingly, we ask for your understanding of the purposes of these activities, as well as your cooperation in this regard.

## Kyocera Group Environmental Safety Policy

The Kyocera Group has put in place the Kyocera Group Environmental Safety Policy, which combines policies on the environment and safety and sanitation, including providing products that contribute to the global environment and contributing to a sustainable society, to promote comprehensive measures for environmental safety based on its management rationale in conducting business activities. Business activities covered by the policies below include business expansion via M&A, where we carry out due diligence to identify potential environmental risks and reflect that in post-acquisition improvement plans.

### 1 . Compliance with laws and other regulations

- Kyocera will comply with laws, agreements, and internal standards regarding the environment and work safety.

### 2 . Provide products that contribute to the global environment

- Kyocera will increase research and development of products that make a positive contribution to the enhancement of the global environment and minimize environmental impact at all stages of the product life cycle; and the Company will strive to spread the use of such products.

### 3 . Contribute to a sustainable society

- Kyocera will promote greenhouse gas emission control in the entire value chain to contribute to the realization of a carbon-free society.
- Kyocera will contribute to the realization of a society with sustainable recycling of resources by purchasing resources with low environmental impact, reducing the volume of new resource consumption, and minimizing waste.
- Kyocera will strive to prevent environmental pollution by properly managing chemical substances in all processes.
- Kyocera will advance conservation of biodiversity by minimizing negative impacts on the natural environment, as well as by protecting and nurturing the natural environment.

### 4 . Ensure employee health and safety and prevent accidents and disasters

- Kyocera aims to build a corporate culture that creates an accident-free and disaster-free workplace environment where everyone can work safely and with peace of mind.
- Kyocera will conduct risk assessments and reduce occupational health and safety risks by eliminating sources of danger in order to prevent workplace accidents and disasters.
- Kyocera strives to build a work environment where employees feel healthy, enjoy job satisfaction and can reach their maximum potential by promoting mental and physical health.

### 5 . Conduct stakeholder communication

- Kyocera will support Corporate Social Responsibility (CSR) activities and communicate with various stakeholders.

### 6 . Operation of an environmental and safety management system

- In the course of business activities, through operation of the management system, the Kyocera Group will proactively promote comprehensive measures for environmental protection and work safety, based on the management rationale, and continuously improve environmental and safety performance.

# Kyocera's Guideline on Environmentally Hazardous Substances

## 1. Objective

The purpose of this Guideline is to specify the chemical substance prohibited or to be managed in raw materials, parts (general purchased products, outsourced products), packing materials, production facilities and so forth Kyocera purchases so that the information we would like our partners to observe is clarified and that the environment-related laws and regulations are observed thoroughly.

We ask our partners to implement environmental load reduction activities according to this Guideline.

## 2. Scope

- (1) The Guideline covers those businesses that supply materials and other articles to Kyocera (comprising vendors and outsourcing businesses).
- (2) It also covers raw materials, parts (that are either available on the market or custom-made through outsourcing), package materials, purchases made by Non-production sector , production facilities and etc. procured by Kyocera. The Company will provide suppliers with a list of articles for which chemical substance contents etc. should be surveyed.

## 3. Definition of Terms

- (1) Substances that Exert an Environmental Load  
This term refers to prohibited chemical substances (ranks A and B), and to controlled chemical substances (rank C).
- (2) Prohibited Chemical Substances (Rank A)  
This term refers to those chemical substances that must not be contained in any articles, and whose use in manufacturing processes is prohibited. These substances are listed in Table 1.
- (3) Prohibited Chemical Substances (Rank B)  
This term refers to those chemical substances that must not be contained in any articles. These substances are listed in Table 2. Some rank B prohibited chemical substances will be prohibited immediately after the issue of the Guideline. Other rank B chemical substances will be prohibited after the elapse of a certain period following the issue of the Guideline. For some substances in this category, provisions may be made to limit their application or specify threshold values.
- (4) Controlled Chemical Substances (Rank C)  
Since neither an alternative material or technology have been established, this term refers to those chemical substances that may be used intentionally, on condition that the status of their use is monitored, and that due consideration is given to recycling and other steps for appropriate management. These substances are listed in Table 2.
- (5) Intentional Use  
This term refers to the conscious addition of a substance by a manufacturer, or the use of a material with a substance added, to create a basic raw material that is added as an ingredient to a product, to achieve a targeted performance or function, or to maintain desirable conditions etc. in a certain process.
- (6) Contain (Contained/Content)  
This term refers to the following cases:
  - (i) When a chemical substance is included in a part, material or product as an ingredient, whether intentionally or not;
  - (ii) When a chemical substance is mixed with other ingredients to maintain desirable

conditions, quality etc. in a production process, and thus becomes included in a part, material or product;

- (iii) When a chemical substance is used in a production process, and remains in, or sticks to, the finished product, part, material or other.

According to our interpretation, the term also refers to cases in which a chemical substance is contained in a natural material, or in which impurities remain after the completion of an industrial refining process. Such chemical substances are not regarded as contained in an article if such containment at any significant level is not technically anticipated, or if no information on such contents is available; however, this does not apply if such containment is problematic in view of relevant domestic and/or foreign regulations.

(7) Impurity

This term refers to the following:

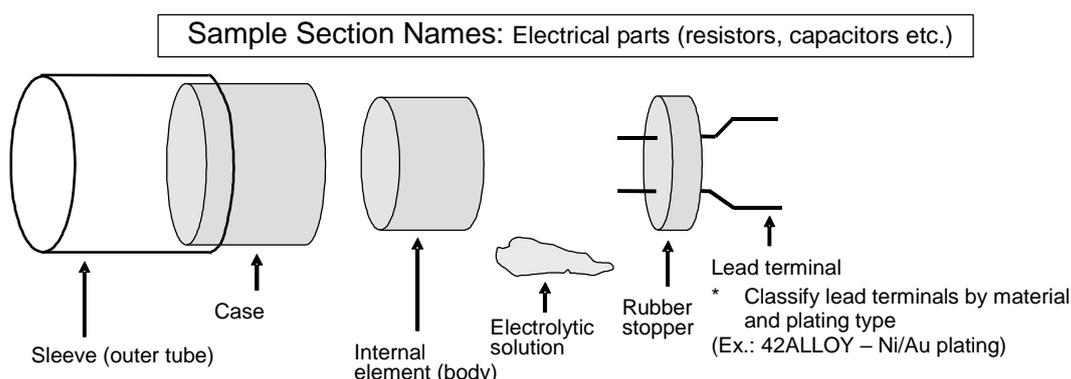
- (i) Substances contained in natural materials that cannot be removed completely using existing technology in a process in which the materials are refined for industrial use;
- (ii) Substances generated during a chemical synthesis reaction that cannot be removed completely using existing technology;
- (iii) Substances (generally referred to as dopants) that are mixed with other ingredients in the manufacture of semiconductor ICs to control semiconductor characteristics.

(8) Threshold

This term refers to the allowable content in an application.  
Indicates the boundary value for concentration.

(9) Section (Relevant Section)

This term refers to a section containing certain chemical substances that are deemed to be uniform in property. "Relevant section" refers to the section of a part that contains the surveyed chemical substances.



(10) SDS

This term refers to Safety Data Sheet describing the properties and handling of chemical substances etc. in conformity with the provisions of the PRTR Law (Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management) and Industrial Safety and Health Law.

(11) Minerals

This term refers to naturally produced minerals that have inorganic crystal structure.

- (12) Substance (chemical substance)  
This term refers to an individual chemical substance.  
Ex. lead oxide, nickel chloride, benzene, etc.
- (13) Mixture  
This term refers to a mixture (including solvent) intentionally comprising two or more individual chemical substances.  
Ex. Paints, inks, solders prior to use, adhesives, alloys, plating material, detergent, etc.
- (14) Article (product formed into a shape)  
This term refers to an item of specific shape, surface, or design provided during manufacture which determines functions in final use at a level beyond that provided by its chemical composition.  
Ex. Capacitors, LSIs, lead frames, screws, etc.

**4. Concept for environmental management on purchased products**

- a. Control of Chemical Substances Contained in Purchased Articles  
The contained chemicals will be checked by obtaining data in accordance with various forms of our specification (see Section 5, Table 1), and managed thoroughly depending on the hazardousness and so forth.
- b. Consideration of the Environmental Impacts of Purchased Equipment  
When introducing equipment, we determine specifications after considering environmental impact. Further, when installing equipment, we control operational status thoroughly at the same time as confirming its specifications.
- c. Specifications of Packaging Materials Used for Purchased Articles  
We endeavor to reduce the amount of package materials used, promote the reuse of such materials, and introduce new materials that can be recycled more easily.  
Additionally, we prohibit the intentional inclusion, including impurities harmful substances (※ 1), as well as exterior package/cushioning materials made of vinyl chloride.

\*1 Hazardous Substances

Mercury and its compounds	Organic phosphorous compounds	Cyanogen compounds	Tetrachloroethylene
Cadmium and its compounds	Hexavalent chromium compounds	PCB	1,1,1-trichloroethane
Lead and its compounds	Arsenic and its compounds	Trichloroethylene	Carbon tetrachloride

- d. Material Marking of Purchased Articles  
To reduce environmental impact, we promote material marking for purchased resin-based articles by designating the specifications of the articles and holding discussions with business partners. This step is aimed at furthering the recycling of purchased articles through sorting at the time of disposal.

## 5. Submission of information on environmental hazardous substances included in procured products

Regarding the specific subject products for which investigation on chemicals is required as well as the forms for information on environmentally hazardous substances (see Table 1) to be prepared by our partners, we will present them through the information management system on chemical substances contained in products (EARTHS) and so forth.

In addition, we may ask you to prepare information in forms that are specified uniquely by our business divisions besides the [common] forms.

[Table 1: Submitted documents for information on substances of environmental concerns]

Submitted documents		Need or no-need of submission		Remarks
Form No.	Title of the form	Chemical substance and preparation	Article <sup>*1</sup>	
Form 2	Warranty of non-use Prohibited Chemical Substances	Submission is necessary.	Submission is necessary.	
-	Report on Constituent Contents	Submission is necessary.	Submission is necessary.	Which could be used, Environmentally Hazardous Substances SurveyTool (JAMP format) or Report on Constituents, will be notify.
Form 3	Environmentally Hazardous Substances Survey Tool (JAMP format)			
-	chemSHERPA CI	Need or no-need of submission will be notified		*2
-	chemSHERPA AI		Need or no-need of submission will be notified	*2
-	SDS	Submission is necessary.	Submission is necessary.	
-	Analysis data	Need or no-need of submission will be notified.	Need or no-need of submission will be notified.	Target products necessary for analysis data and detailed analysis methods will be notified.
Form 4	Certificate of constituent Contents	Need or no-need of submission will be notified.	Need or no-need of submission will be notified.	This is a format submitted to guarantee each delivery lot. Details will be notified.
Form 5	Application for change	Submission is necessary.	Submission is necessary.	

\*1: Packaging materials for our products delivered to our customers are included, too.

\*2: The JAMP MSDSplus/AIS download service has been terminated as of the end of June 2018, so please use the chemSHERPA tool to answer this question.

### [Explanation of submitted documents]

#### ■ Warranty of non-use Prohibited Chemical Substances (Form 2)

This form is to certify the no containing of the Prohibited Chemical Substances (Rank A or B) listed in Kyocera Environmentally Hazardous Substances Guideline as well as nonuse of Prohibited Chemical Substances of Rank A in manufacturing processes.

#### ■ Survey Response Tools (JAMP format)

Report information on chemical substances contained in the products delivered to our company by the use of the JAMP format. Incidentally, submit the survey format when we request and when constituent materials are changed. .

[Report Criteria]

- a. Chemical substances added intentionally, or detected to be contained in any amount.
- b. Chemical substances that are not added intentionally, but contained as impurely.

#### ■ JAMP chemSHERPA CI, AI

Report information on chemical substances contained in the products delivered to our company by the following tools;

Chemical substances and preparation => Use the chemSHERPA CI

Article => Use the chemSHERPA AI

Incidentally, submit the survey format when we request and when constituent materials are changed.

[Report Criteria]

- a. Chemical substances added intentionally, or detected to be contained in any amount.
- b. Chemical substances that are not added intentionally, but contained as impurely.

#### ■ Report of Constituent Contents (attached Form 3)

Two types of formats are available, one for “chemical substance” and “preparation” and the other for “articles”.

Report all the constituents that form products delivered to our company by the use of Report on Constituent Contents (Forms 3-1 and 3-2). Incidentally, submit the report when any material is newly adopted, when constituent material is changed, and when we request.

[Report Criteria]

- a. Chemical substances added intentionally, or detected to be contained in any amount.
- b. Chemical substances that are not added intentionally, but contained as impurely.  
(If content ratio is not identified but the substance may be contained as impurities, report the substance name only.)

#### ■ SDS

Submit SDS complied with the PRTR Law and Industrial Safety and Health Law.

#### ■ Analysis Data

Include “analysis method, pre-conditioning method, analysis equipment manufacturers, equipment No., method detection limit, calibration curve data, and analysis report” in the analysis data.

The analysis methods, in principle, comply with those declared in Attached Table 2, but can be accepted if combinations of pre-conditioning and analysis equipment can certify that method detection limit is lower than the thresholds prescribed in Attached Table.

Submit the analysis data when any material is newly adopted, when constituent material is

changed, and when we request.

■ Certificate of Constituent Contents (Form 4)

Make sure the relevant delivered lot can certificate the following content and enter the content that corresponds to the following with the inspection report, etc. of the members to be delivered: “We hereby certify that this content is same as the content of the on Environmentally Hazardous Substances Survey Tools (JAMP format) or the content of the Report on Constituent Contents submitted on MM/DD/YY.”

For articles with no Inspection report etc., provided, please use attached Form 4 (Certificate of Constituent Contents).

■ Application for Change (Form 5)

If some of the contents of a delivered article have changed or if such a change is likely to take place (regarding material specifications, the supplier etc.), the change should be reported in advance by submitting the following documents:

- (i) Application for Change (attached Form 5)
- (ii) Documents already submitted, which need to be re-submitted as a result of the change.

In the event that the present guidelines are changed because of changes in law, ordinances, social circumstances, customer needs, and others, submit necessary documents that correspond to the content changed for goods continuously supplied.

## **6. Requests regarding management of four phthalates restricted by RoHS Directive and REACH Regulation**

As you are aware, the four phthalates listed below were added to the list of restricted substances under the RoHS Directive in July 2019, and they also are restricted by the REACH Regulation from July 2020.

- Dibutyl phthalate : DBP(CAS No84-74-2)
- Di (2-ethylhexyl) phthalate : DEHP(CAS No117-81-7)
- Butyl benzyl phthalate : BBP(CAS No85-68-7)
- Diisobutyl phthalate : DIBP(CAS No84-69-5)

The four phthalates are widely used as a plasticizer in products made of vinyl chloride or rubber, but contamination caused by their improper use or addition during manufacturing processes and contamination due to migration of the plasticizer are matters of concern. For this reason, it is necessary to ensure thorough management throughout the supply chain.

### **(1) Preventing contamination due to improper use and addition during manufacturing processes**

Even if the four restricted phthalates are replaced with alternative plasticizers, contamination of products using alternative plasticizers caused by the improper use or addition of the four restricted phthalates cannot be eliminated unless manufacturing processes, containers, etc. are separated according to the type of plasticizer used in the manufacturing processes of plasticizers, processes in which plasticizers are mixed with resin or raw materials of rubber, and molding processes of vinyl chloride and rubber.

When any of the four restricted phthalates and an alternative plasticizer are added using the same manufacturing processes, containers, etc., periodic inspections of the state of contamination will be required in addition to cleaning of the manufacturing processes, containers, etc.

We ask businesses that supply goods using a plasticizer to conduct proper management internally, and to also ensure thorough management by upstream processors and provide necessary support.

(2) Preventing contamination by migration during manufacturing processes

Because plasticizers do not form chemical bonds with vinyl chloride and rubber polymers, it is known that a plasticizer contained in a molded product "migrates" to another molded product under certain conditions.

For this reason, it is necessary to be vigilant against unintended contamination by migration. If businesses or upstream processors use anti-static mats, jigs, tools, rubber gloves, vinyl bags, etc. containing any of the four restricted phthalates in the form of a plasticizer in their manufacturing processes or for shipping purposes, and if a product comes in direct contact with any of them, the plasticizer may migrate to the product.

To minimize the risk of contamination, any anti-static mats, jigs, tools, rubber gloves, vinyl bags, etc. containing any of the four restricted phthalates in the form of a plasticizer should be removed from manufacturing processes and items used for shipping purposes. If this is difficult, please conduct appropriate management to make sure that, even if migration occurs through contact, no homogeneous material contains any of the four restricted phthalates above 1,000 ppm. In addition, please ensure thorough management by upstream processors and provide necessary support.

**7. Transmission to secondary partners**

(1) When the Partner is a Manufacturer

If a manufacturer with whom we have a business relationship procures parts or materials from other producers to produce articles for delivery to us, or if the manufacturer entrusts another business with the finishing of an article, the manufacturer is asked to direct the producer or business to carry out Environmentally hazardous substance management activities in accordance with this Guideline and confirm that such activities fulfill related requirements. Additionally, the manufacturer is requested to provide all necessary support to producers and businesses in this regard.

(2) When the Partner is a Trading Company

Any trading company with whom we have a business relationship is asked to communicate this Guideline to manufacturers from whom it purchases articles for delivery to us. As well, trading companies are requested to direct such manufacturers to carry out Environmentally hazardous substance management activities in accordance with the Guideline. Additionally, trading companies should collect information on the status of compliance with the Guideline from such manufacturers, and provide this information to us.

**8. Others**

We make the information submitted from your company available in Kyocera Corporation and use for control of environmental hazardous substance and for answer customer's inquires. In addition, we may communicate the information from your company to third party as Kyocera's information for compliance with law.

[Contact] Kyocera Corporation  
Environmental & Safety Division:  
kan.green01@kyocera.jp

[Table 1] List of Prohibited Substances (Rank A)

No	Substance group	Substance group Relevant laws, ordinances etc.
1	CFCs (Annex A Group I substances in the Montreal Protocol)	Ozone Layer Protection Law (Specific Substances)*2
2	Halons (Annex A Group II substances in the Montreal Protocol)	
3	Other CFCs (Annex B Group I substances in the Montreal Protocol)	
4	Carbon tetrachloride (Annex B Group II substance in the Montreal Protocol)	
5	1.1.1-trichloroethane (Annex B Group III substance in the Montreal Protocol)	
6	Bromochloromethane (Annex C Group III substance in the Montreal Protocol)	
7	Methyl bromide (Annex E substance in the Montreal Protocol)	
8	HBFCs (Annex C Group II substances in the Montreal Protocol)	
9	HCFCs (Annex C Group I substances in the Montreal Protocol)	

Note 1: This Guideline does not cover Prohibited Substances (rank A) not used directly in production processes.

\*1: This is a number assigned to each substance group by JGPSSI for classification of the substance.

\*2: Details of Specific Substances in the Ozone Layer Protection Law are shown in Table 4

[Table 2] List of Prohibited/Controlled Chemical Substances (Rank B/C)

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Metals and metal compounds	1	Cadmium and cadmium compounds					IEC62474 *12
			B	Paints, inks, plastics, package materials *2	5ppm	Immediate	
			B	Solder	20ppm	Immediate	
			B	Batteries installed to Kyocera's products and shipped to Kyocera's customer.	*3	Immediate	
			B	Cadmium and its compounds in one shot pellet type thermal cut-offs	100ppm	Immediate	
			B	Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm 2 of light-emitting area) for use in solid state illumination or display systems	100ppm	Immediate	
			B	Applications other than those for rank B (paints, inks, plastics, package materials, solder) and rank C [metals that contain zinc (zinc die cast, galvanizing, etc.)]	100ppm	Immediate	
			B	Cadmium in photoresist for analog opto-coupler to be used for professional audio equipment.	100ppm	Immediate	
			B	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more.	100ppm	Immediate	
			B	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide.	100ppm	Immediate	
C	-Cadmium and its compounds in electrical contacts used in: - circuit breakers, - thermal sensing controls, - thermal motor protectors (excluding hermetic thermal motor protectors), - AC switches rated at:6 A and more at 250 V AC and more, or 12 A and more at 125 V AC and more, - DC switches rated at 20 A and more at 18 V DC and more, - switches for use at voltage supply frequency ≥ 200 Hz. -Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex -Cadmium in glazes used for reflectance standards - Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses			—	—		
[Exceptions] Substances in equipment, tools, jigs, dies etc., when there is no possibility of their becoming contained in any products (Ex.: cadmium contained in a die (silver braze) for press working)							
(Analysis method) (a) Simple analysis (screening measurement) [Method] X-ray fluorescence spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer and wave length dispersive X-ray Fluorescence Spectrometer [Summary] After cutting and pulverizing samples, collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not cadmium is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content. (b) Detailed analysis (quantitative analysis) [Method] ICP optical emission spectrometry [Equipment] ICP optical emission spectrometer (ICP-OES), ICP mass spectrometer (ICP-MS), atomic absorption spectrometer (AAS) [Summary] Completely dissolve and analyze samples. In the event that any residue is generated, completely dissolve by an alkali fusion method, etc. Introduce the prepared solution sample into the ICP-OES and from the calibration curve prepared by the standard solution, measure the concentration of cadmium in the solution sample, and convert into the cadmium content in solid samples.							
	2	Hexavalent chromium compounds					IEC62474 *12
			B	Package materials *2	100ppm	Immediate	
			B	Applications other than those for rank B (package materials) and rank C [rustproof treatment on plating surface, element of ink and paints]	1000ppm	Immediate	
			C	-Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution.	—	—	
[Exceptions] Substances in equipment, tools, jigs, dies etc., when there is no possibility of their becoming contained in any products							
(Analysis method) (1) Simple analysis (screening measurement) [Method] X-ray fluorescent spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer and wave length dispersive X-ray Fluorescence Spectrometer [Summary] After cutting and pulverizing samples, collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not chromium is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content. This method is not intended to measure the amount of hexavalent chromium but to measure the amount of chromium. (2) Detailed analysis (quantitative analysis) [Method] Diphenylcarbazide absorption photometry [Equipment] Absorptiometer, ion chromatography equipment [Summary] After extracting samples by boiling water, submit the extract solution to the analysis. After extracting by the alkali solution, dilute with ion-exchange water until a constant weight is reached. Selectively determine hexavalent chromium contained in the assay sample solution using diphenylcarbazide absorption photometry and ion chromatography. From the calibration curve prepared by the standard solution, measure the concentration of hexavalent chromium in the solution sample and convert into the hexavalent chromium content in the sample.							

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks	
Metals and metal compounds	3	Lead and lead compounds						IEC62474 *12
		B	Paints, inks, plastics, package materials *2	100ppm	Immediate			
		B	Batteries installed to Kyocera's products and shipped to Kyocera's customer.	*3	Immediate			
		B	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC.	1000ppm	Immediate			
		B	Lead used in C-press compliant pin connector systems.	1000ppm	Immediate			
		B	Lead used in other than C-press compliant pin connector systems.	1000ppm	Immediate			
		B	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a leadcontent of more than 80 % and less than 85 % and the package of microprocessors with a leadcontent of more than 80 % and less than 85 % by weight.	1000ppm	Immediate			
		B	Lead in linear incandescent lamps with silicate coated tubes.	1000ppm	Immediate			
		B	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba) 2 MgSi 2 O 7 :Pb).	1000ppm	Immediate			
		B	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).	1000ppm	Immediate			
		B	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs).	1000ppm	Immediate			
		B	Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm and less.	1000ppm	Immediate			
		B	Lead oxide in the glass envelope of black light blue lamps.	1000ppm	Immediate			
		B	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.	1000ppm	Immediate			
		B	Applications other than those for rank B (paints, inks, plastics, package materials) and rank C [surface treatment and solders for external electrodes and lead terminals of components]	1000ppm	Immediate			
		B	The PZT lead-based dielectric ceramic capacitor to be used for discrete components, in an integrated circuit device (lead zirconate titanate)	1000ppm	Immediate			
		B	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications.	1000ppm	Immediate			
		B	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications.	1000ppm	Immediate			
		B	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring.	1000ppm	Immediate			
		B	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting).	1000ppm	Immediate			
B	Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers.	1000ppm	Immediate					
C	<ul style="list-style-type: none"> <li>- Electroless nickel/gold plating; electrolytic gold plating; parts, materials and chemicals used for such plating;</li> <li>- Lead in glass of cathode ray tubes.</li> <li>- Lead in glass of fluorescent tubes not exceeding 0.2 % by weight .</li> <li>- Lead as an alloying element in steel for machining purposes containing up to 0.35% lead by weight and in batch hot dip galvanised steel components containing up to 0.2% lead by weight.</li> <li>- Lead as an alloying element in aluminium containing up to 0.4 % lead by weight, provided it stems from lead-bearing aluminium scrap recycling.</li> <li>- Lead as an alloying element in aluminium for machining purposes with a lead content up to 0.4 % by weight.</li> <li>- Copper alloy containing up to 4 % lead by weight.</li> <li>- Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead).</li> <li>- Lead in solders for servers, storage and storage array systems, Network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications.</li> <li>- Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.</li> <li>- Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher.</li> <li>- Lead in white glasses used for optical applications.</li> <li>- Lead in ion coloured optical filter glass types</li> <li>- lead in glazes used for reflectance standards</li> <li>- Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies: <ul style="list-style-type: none"> <li>- a semiconductor technology node of 90 nm or larger;</li> <li>- a single die of 300 mm2 or larger in any semiconductor technology node;</li> <li>- stacked die packages with die of 300 mm2 or larger, or silicon interposers of 300 mm2 or larger.</li> </ul> </li> <li>- 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 (BaSi 2 O 5 :Pb)</li> <li>- Lead in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses.</li> </ul>			—	—			

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Metals and metal compounds	3	Lead and lead compounds					IEC62474 *12
		C	<ul style="list-style-type: none"> <li>- Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors.</li> <li>- Lead bound in crystal glass as defined in Annex I (Categories 1,2,3 and 4) of Council Directive 69/493/EEC(1).</li> <li>- Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes.</li> <li>- Lead in cermet-based trimmer potentiometer elements.</li> <li>- Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body.</li> </ul>	—	—		
<p>[Exceptions] Substances in equipment, tools, jigs, dies etc., when there is no possibility of their becoming contained in any products.</p> <p>(Analysis method) (1) Simple analysis (screening measurement) [Method] X-ray fluorescent spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer and wave length dispersive X-ray Fluorescence Spectrometer [Summary] After cutting and pulverizing samples, collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not lead is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content. (2) Detailed analysis (quantitative analysis) [Method] ICP optical emission spectrometry [Equipment] ICP optical emission spectrometer (ICP-OES), ICP mass spectrometer (ICP-MS), atomic absorption spectrometer (AAS) [Summary] Completely dissolve and analyze samples. In the event that any residue is generated, completely dissolve by an alkali fusion method, etc. Introduce the prepared solution sample into the ICP-OES, and from the calibration curve prepared by the standard solution, measure the concentration of lead in the solution sample, and convert into the lead content in solid samples.</p>							
	4	Mercury and mercury compounds					IEC62474 *12
		B	Paints, inks, plastics, package materials *2	100ppm	Immediate		
		B	Batteries installed to Kyocera's products and shipped to Kyocera's customer.	*3	Immediate		
		B	- Mercury in other fluorescent lamps not exceeding (per lamp) -Linear halophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	1000ppm	Immediate		
		B	- Mercury in other fluorescent lamps not exceeding (per lamp) Non-linear halophosphate lamps (all diameters): 15 mg	1000ppm	13/04/2016		
		B	Mercury in High Pressure Mercury (vapour) lamps (HPMV)	1000ppm	Immediate		
		B	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display.	1000ppm	Immediate		
		B	Applications other than those for rank B (paints, inks, plastics, package materials) and rank C	1000ppm	Immediate		
C	<ul style="list-style-type: none"> <li>- Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):</li> <li>•For general lighting purposes &lt; 30 W: 2.5 mg</li> <li>•For general lighting purposes ≥ 30 W and &lt; 50 W: 3.5 mg</li> <li>•For general lighting purposes ≥ 50 W and &lt; 150 W: 5 mg</li> <li>•For general lighting purposes ≥ 150 W: 15 mg</li> <li>•For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm:7 mg</li> <li>•For special purposes: 5 mg</li> <li>Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):</li> <li>•Tri-band phosphor with normal lifetime and a tube diameter &lt; 9 mm:4</li> <li>•Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm :3 mg</li> <li>•Tri-band phosphor with normal lifetime and a tube diameter &gt; 17 mm and ≤ 28 mm:3.5 mg</li> <li>•Tri-band phosphor with normal lifetime and a tube diameter &gt; 28</li> <li>•Tri-band phosphor with long lifetime (≥ 25 000 h): 5 mg</li> <li>• Mercury in other fluorescent lamps not exceeding (per lamp):</li> <li>•Non-linear tri-band phosphor lamps with tube :ires on 31 December 2012; 3,(*)diameter &gt; 17 mm:15mg</li> <li>•Lamps for other general lighting and special purposes (e.g. induction lamps):15mg</li> <li>•Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):</li> <li>•Short length (≤ 500 mm):3.5 mg</li> <li>•Medium length (&gt; 500 mm and ≤ 1 500 mm): 5 mg</li> <li>•Long length (&gt; 1 500 mm):13 mg</li> <li>Mercury in other low pressure discharge lamps (per lamp) :15mg</li> <li>•Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra &gt; 60</li> <li>•P ≤ 155 W:30 mg</li> <li>•155 W &lt; P ≤ 405 W:40 mg</li> <li>•P &gt; 405 W:40mg</li> <li>•Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):</li> <li>•P ≤ 155 W:25 mg</li> </ul>	—	—				

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Metals and metal compounds	4	Mercury and mercury compounds			-	-	IEC62474 *12
		C	<ul style="list-style-type: none"> <li>• 155 W &lt; P ≤ 405 W:30 mg</li> <li>• P &gt; 405 W:40mg</li> </ul> Mercury in metal halide lamps (MH); Mercury in other discharge lamps for special purposes not specifically mentioned in rank C				
			[Exceptions] Substances in equipment, tools, jigs, dies etc., when there is no possibility of their becoming contained in any products.				
			(Analysis method) (1) Simple analysis (screening measurement) [Method] X-ray fluorescent spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer and wave length dispersive X-ray Fluorescence Spectrometer [Summary] After cutting and pulverizing samples, collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not mercury is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content. (2) Detailed analysis (quantitative analysis) [Method] ICP optical emission spectrometry [Equipment] ICP optical emission spectrometer combined with reduction aeration (ICP-OES), atomic absorption spectrometer combined with reduction aeration (AAS), ICP mass spectrometer (ICP-MS) [Summary] Using a decomposition flask equipped with a pressure-decomposer or reducing-cooler, prevent vaporization of mercury, decompose the sample by sulfuric acid or nitric acid, and bring the sample into solution. Measure the solubilized sample by ICP-OES. In the case of traces of mercury, measure mercury by ICP optical emission spectrometer combined with reduction aeration (ICP-OES) or atomic absorption spectrometer combined with reduction aeration (AAS) (in such event, coexisting elements may interfere and verification is required). From the calibration curve prepared by the standard solution, measure the concentration of mercury in the solution sample, and convert into the mercury content in solid samples.				
	5	Trisubstituted organotin compounds (including Bis (tri-n-butyltin) oxide (TBTO)/tributyltin (TBT) compounds and triphenyltin (TPT) compounds)			1000ppm	Immediate	IEC62474 *12 *9 REACH (Restriction)
		B	All applications				
	6	Dibutyltin (DBT) compounds			-	Immediate	IEC62474 *12 REACH (Restriction)
		B	If the concentration of DBT compounds exceeds 0.1wt%, upon calculation of Sn weight in the article and all related parts.				
		C	All applications other than rank B.				
	7	Diocetyl tin (DOT) compounds			-	Immediate	IEC62474 *12 REACH (Restriction)
		B	The following products and parts used by the general public or the general public use, which containing the DOT over the 0.1Wt% in terms of weight of tin . <ul style="list-style-type: none"> <li>• Textile products for skin contact</li> <li>• Gloves</li> <li>• Part of the footwear or footwear for skin contact</li> <li>• Wallpaper and floor agent</li> <li>• RTV-2 mold kit</li> </ul>				
		C	All applications other than rank B.				
	8	Organotin compounds other than Bis (tri-n-butyltin) oxide (TBTO), Tributyltins (TBTs) and triphenyltin			-	-	
		C	All applications				
	9	Cobalt dichloride			-	Immediate	IEC62474 *12
		B	Cobalt dichloride contained in desiccant agent and/or humidity indicator that are shipped with Kyocera's products to Kyocera's customer.				
		C	All applications other than rank B.				
	10	Antimony and antimony compounds			-	-	
		C	All applications				
	11	Arsenic and arsenic compounds			-	Immediate	IEC62474 *12 REACH (Authorization)
		B	All applications <Chemical Substances> Diarsenic trioxide, Diarsenic pentaoxide				
		C	All applications other than rank B.				
	12	Beryllium and beryllium compounds			-	-	IEC62474 *12
		C	All applications				
	13	Bismuth and bismuth compounds			-	-	IEC62474 *12
		C	All applications				
	14	Nickel and nickel compounds *5			-	Immediate	IEC62474 *12
		B	If the rate of nickel release from the parts of these products coming into direct and prolonged contact with the skin is greater than 0.5 µg/cm <sup>2</sup> /week;				
		C	All applications other than rank B.				
	15	Selenium and selenium compounds			-	-	
		C	All applications				
	16	Thallium and thallium compounds			-	-	
		C	All applications				
	17	Pentazinc chromate octahydroxide			-	-	IEC62474 *12 REACH(SVHC)
		C	All applications				
	18	Potassium hydroxyoctaoxodizincate dichromate			-	-	IEC62474 *12 REACH(SVHC)
		C	All applications				

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Halogenated	19	Polybrominated biphenyls (PBBs)					IEC62474 *12
		B	All applications	1000ppm	Immediate		
			(Analysis method) (1) Simplified Simple analysis (screening measurement) [Method] X-ray fluorescent spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer [Summary] Implement simple pretreatment on samples, such as cutting, pulverizing, etc., collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not bromine is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content of total bromine. This method is not intended for measuring the amount of PBB or PBDE but for measuring the amount of total bromine. (2) Detailed analysis (quantitative analysis) [Method] Gas chromatography [Equipment] High-resolution gas chromatograph/high-resolution mass spectrometer (HRGC) [Summary] For the pretreatment method, freeze samples, freeze and pulverize in the light-shielded conditions, dissolve and extract by the inorganic solvent. Add 13C12 labeled internal standard to the sample solution, and analyze by a high-resolution double-focusing mass spectrometer.				
	20	Polybrominated diphenyl ethers (PBDEs)					IEC62474 *12
		B	All applications	1000ppm	Immediate		
			(Analysis method) (1) Simple analysis (screening measurement) [Method] X-ray fluorescent spectroscopy [Equipment] Energy Dispersive X-ray Fluorescence Spectrometer [Summary] After cutting and pulverizing samples, collect samples of a predetermined volume and weight and guide them into the analysis equipment; this enables analysis as to whether or not bromine is contained as well as the order analysis in a simplified manner. This is suited for analysis of resin, rubber, metal, glass, ceramic members. Using semi-quantitative analysis software (fundamental parameter method) and quantitative analysis software (calibration curve method) incorporated in the equipment, measure the content of total bromine. This method is not intended for measuring the amount of PBB or PBDE but for measuring the amount of total bromine. (2) Detailed analysis (quantitative analysis) [Method] Gas chromatography [Equipment] High-resolution gas chromatograph/high-resolution mass spectrometer (HRGC) [Summary] For the pretreatment method, freeze samples, freeze and pulverize in the light-shielded conditions, dissolve and extract by the inorganic solvent. Add 13C12 labeled internal standard to the sample solution, and analyze by a high-resolution double-focusing mass spectrometer.				
	21	Polychlorinated biphenyls (PCBs)					IEC62474 *12 *9
		B	All applications	—	Immediate		
	22	Polychlorinated naphthalenes (Cl >= 1)					IEC62474 *12 Industrial Safety and Health Law*8
		B	All applications	—	Immediate		
	23	Short chain chlorinated paraffins *6					IEC62474 *12 *9
		B	All applications	—	Immediate		
24	Brominated flame retardants *7					IEC62474 *12	
	C	All applications	—	—			
25	Chlorinated Flame Retardants (CFR)					IEC62474 *12 REACH(SVHC)	
	C	All applications	—	—			
26	Vinyl chloride polymer (PVC)						
	B	Recycled material using 4 substances which are B rank of phthalate ester specified in Substance No. 38	—	Immediate			
		C	All applications other than rank B.	—	—		
Others	27	Asbestos					IEC62474 *12 Industrial Safety and Health Law*8
		B	All applications(Intentional Use Prohibit)	1000ppm	Immediate		
			(Analysis method) (1) Analysis of asbestos content in natural mineral products [Method] Analysis method of asbestos content in natural mineral products (Circular No. 0828001 (August 28, 2006) by the Director of the Chemical Hazards Control Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare) (2) Analysis of asbestos content in others [Method] Analysis method of asbestos content in building material(Circular No. 0821002 (August 21, 2006) by the Director-General of the Labour Standards Bureau, Ministry of Health, Labour and Welfare)				
	28	White phosphorus					Industrial Safety and Health Law*8
		B	White phosphorus matches	10000ppm	Immediate		
	29	Red phosphorus					
		B	Flame retardant in resin(excluding flame retardant possessing water resistance)	—	Immediate		
		C	All applications other than rank B.	—	—		
	30	Benzidine and its salt					Industrial Safety and Health Law*8
		B	All applications	10000ppm	Immediate		
	31	4-aminobiphenyl and its salt					Industrial Safety and Health Law*8
		B	All applications	10000ppm	Immediate		
32	4-nitrobiphenyl and its salt					Industrial Safety and Health Law*8	
	B	All applications	10000ppm	Immediate			
33	Bis(chlorometyl) ether					Industrial Safety and Health Law*8	
	B	All applications	10000ppm	Immediate			

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks	
Others	34	Beta-naphthylamine and its salt						
			B	All applications	10000ppm	Immediate	Industrial Safety and Health Law*8	
	35	Benzene	B	Rubber cement contains benzene (The amount of benzene is more than 5% weight of solvent in the rubber cement) (including diluted solution)	50000ppm	Immediate		Industrial Safety and Health Law*8
			B	Applications that involve the possibility of the substance directly contacting human skin or buccal cavity for long time	30ppm	Immediate	IEC62474 *12 REACH (Authorization)	
	36	Azo dyes that generate certain specific amines *8						IEC62474 *12
			B	Applications that involve the possibility of the substance directly contacting human skin or buccal cavity for long time	30ppm	Immediate		
	37	Radioactive substances	B	Except for instrument-related applications	—	Immediate	IEC62474 *12	
			C	Instrument-related applications	—	—		
	38	Phthalates						IEC62474 *12 REACH (Restriction) RoHS Directive
			B	All applications containing the following four substances: Purchased items separately designated by our Company may be treated as Rank C. Additionally, threshold values for each regulation are as shown below; ※RoHS Directive: Content concentration for 1 regulated substance must be less than 1000 ppm ※REACH Regulation: Total content concentration for 4 regulated substances must be less than 1000 ppm <Target substance> -Dibutyl phthalate: DBP(CAS No84-74-2) -Di (2-ethylhexyl) phthalate: DEHP(CAS No117-81-7) -Butyl benzyl phthalate: BBP(CAS No85-68-7) -Disobutyl phthalate: DIBP(CAS No84-69-5)		Immediate		
			C	All applications containing phthalic acid esters other than chemical substances designated as Rank B	—	—		
	39	Trichloroethylene	B	All applications	—	Immediate		
			B	All applications	—	Immediate		
	40	Tetrachloroethylene	B	All applications	—	Immediate		
			B	All applications	—	Immediate		
	41	Dichloromethane	B	All applications other than rank C	—	Immediate		
			C	-Residue in polycarbonate resin -Residue of dichloromethane used as a solvent in manufacturing process	—	—		
	42	Dioxins	B	All applications	—	Immediate		
			B	All applications	—	Immediate		
	43	Perfluorooctane sulfonate (PFOS) and its salts	B	Intentional use	—	Immediate	IEC62474 *12 *9  Stockholm Convention on Persistent Organic Pollutants	
				Within articles or parts	1000ppm			
				Surface Preparation	1μ g/m2			
		C	- Semiconductor resists - Etching agents for semiconductors (limited to voltage filters and high-frequency compound semiconductors) - Photo films for industrial purposes	—	—			
	44	Perfluorooctane sulfonyl fluoride(PFOSF)	B	All applications	—	Immediate	*9	
			B	All applications	—	Immediate		
	45	Hexachlorobenzene	B	All applications other than rank C	—	Immediate	*9	
			C	In the case that small amounts are included as a by-product, and there is no risk of causing damage to the growth or habitat of animals and plants or risk to human health through pollution of the environment due to such by-products, and the level of content ratio is deemed to be feasibly reduced by all industrial and economical means.	—	—		
	46	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-exo-1,4-endo-5,8-dimethano-naphthalene (also known as Aldrin)	B	All applications	—	Immediate	*9	
			B	All applications	—	Immediate		
	47	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-endo-5,8-dimethano naphthalene (also known as Dieldrin)	B	All applications	—	Immediate	*9	
			B	All applications	—	Immediate		
	48	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo-1,4-endo-5,8-dimethano naphthalene (also known as Endrin)	B	All applications	—	Immediate	*9	
			B	All applications	—	Immediate		
	49	1,1,1-Trichloro-2,2-bis(4-chlorophenyl) ethane (also known as DDT)	B	All applications	—	Immediate	*9	
B			All applications	—	Immediate			
50	Mixture of 1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene,1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indeneand their analogouscompounds (also known as Chlordane or Heptachlor)	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
51	N,N'-Ditolyl-p-phenylenediamine,N-tolyl-N'-xytyl-p-phenylenediamine, or N,N'-dixytyl-p-phenylenediamine	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
52	2,4,6-Tri-tert-butylphenol	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
53	Polychloro-2,2-dimethyl-3-methylidenebicyclo[2.2.1]heptane (also known as Toxaphene)	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
54	Dodecachloropentacyclo [5.3.0.02.6.03.9.04.8] decane (also known as Mirex)	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
55	2,2,2- Trichloro-1,1- bis(4-chlorophenyl) ethanol(also known as Kelthane or Dicofof)	B	All applications	—	Immediate	*9		
		B	All applications	—	Immediate			
56	Hexachlorobuta-1,3-diene	B	All applications	—	Immediate	US-TSCA *9		
		B	All applications	—	Immediate			

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Others	57	Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)-	B	All applications	—	Immediate	
	58	Pentachlorobenzene	B	All applications	—	Immediate	*9
	59	r-1,c-2,t-3,c-4,t-5,t-6-hexachlorocyclo hexane(Alphahexachlorocyclohexane)	B	All applications	—	Immediate	*9
	60	r-1,t-2,c-3,t-4,c-5,t-6-hexachlorocyc lohexane (Betahexachlorocyclohexane)	B	All applications	—	Immediate	*9
	61	r-1,c-2,t-3,c-4,c-5,t-6-hexachlorocyclohexane(Gamma hexachlorocyclohexane or lindane)	B	All applications	—	Immediate	*9
	62	Decachloropentacyclo [5.3.0 2.6.03.9,04,8] decane-5-one(Chlordecone)	B	All applications	—	Immediate	*9
	63	5-tert-butyl-2,4,6-trinitro-m-xylene [musk xylene]	B	All applications	—	Immediate	REACH (Authorization)
	64	Tris(2-chloroethyl) phosphate	B	All applications	—	Immediate	REACH (Authorization)
	65	PFC, SF6,HFC	C	All applications	—	—	
	66	Formaldehyhde	B	Composite wood products or components	—	Immediate	
			C	Applications of non-reactive substances present in phenolic resins, and applications of all substances other than Rank B substances	—	—	
	67	Perchlorate compounds	C	All applications	—	—	IEC62474 *12
	68	2,4-Dinitrotoluene	C	All applications	—	—	
	69	Anthracene oil	C	All applications	—	—	
	70	Anthracene oil, anthracene paste, distn. Lights	C	All applications	—	—	
	71	Anthracene oil, anthracene paste, anthracene fraction	C	All applications	—	—	
	72	Anthracene oil, anthracene-low	C	All applications	—	—	
	73	Anthracene oil, anthracene paste	C	All applications	—	—	
	74	Aluminosilicate, Refractory Ceramic Fibres	C	All applications	—	—	IEC62474 *12 REACH(SVHC)
	75	Zirconia Aluminosilicate, Refractory Ceramic Fibres	C	All applications	—	—	IEC62474 *12 REACH(SVHC)
	76	Coal tar pitch, high temperature	C	All applications	—	—	
	77	Acrylamide	C	All applications	—	—	
	78	Dimethyl fumarate(DMF)	B	All applications	0.1ppm	Immediate	IEC62474 *12
	79	Hexabromocyclododecane (HBCDD)	B	All applications	100ppm	Immediate	IEC62474 *12 REACH (Authorization)
	80	Polycyclic aromatic hydrocarbons (PAHs)*13	B	When any of the above PAH are included at more than 1ppm in rubber or plastic components which come in contact with human skin or the oral cavity directly, either for a long time or short period of time. <Chemical Substances> •Benzo[a]pyrene (BaP) •Benzo[e]pyrene (BeP) •Benzo[a]anthracene (BaA) •Chrycene (CHR) •Benzo[b]fluoranthene (BbFA) •Benzo[j]fluoranthene (BjFA) •Benzo[k]fluoranthene (BkFA) •Dibenzo[a,h]anthracene (DBAha)	1ppm	Immediate	REACH (Restriction)
			C	All applications other than rank B / PAHs other than rank B			
	81	Boric acid	C	All applications	—	—	IEC62474 *12 REACH(SVHC)
	82	Disodium tetraborate, anhydrous	C	All applications	—	—	IEC62474 *12 REACH(SVHC)
	83	Tetraboron disodium heptaoxide, hydrate	C	All applications	—	—	REACH(SVHC)
	84	Cobalt( II) sulphate	C	All applications	—	—	REACH(SVHC)
	85	Cobalt( II) dinitrate	C	All applications	—	—	REACH(SVHC)
	86	Cobalt( II) carbonate	C	All applications	—	—	REACH(SVHC)
	87	Cobalt( II) diacetate	C	All applications	—	—	REACH(SVHC)
	88	2-Methoxyethanol	C	All applications	—	—	REACH(SVHC)
	89	2-Ethoxyethanol	C	All applications	—	—	REACH(SVHC)
	90	2-ethoxyethyl acetate	C	All applications	—	—	REACH(SVHC)
	91	1,2-Benzenedicarboxylic acid,di-C7-11-branched and linear alkyl esters	C	All applications	—	—	IEC62474 *12 REACH(SVHC)

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks	
Others	92	Hydrazine						
			C	All applications	—	—	REACH(SVHC)	
	93	1-methyl-2-pyrrolidone						
			C	All applications	—	—	REACH(SVHC)	
	94	1,2,3-trichloropropane						
			C	All applications	—	—	REACH(SVHC)	
	95	1,2-benzenedi carboxylic acid, di-C6-8-branched alkyl esters, C7-rich [DIHP]						IEC62474 *12 REACH (Authorization)
			C	All applications	—	—		
	96	Formaldehyde, oligomeric reaction products with aniline						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	97	Bis(2-methoxyethyl) phthalate						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	98	2-Methoxyaniline; o-Anisidine						REACH(SVHC)
			C	All applications	—	—		
	99	4-(1,1,3,3-tetramethylbutyl) phenol, 4-tert-Octylphenol						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	100	1,2-Dichloroethane						REACH(SVHC)
			C	All applications	—	—		
	101	Bis(2-methoxyethyl) ether						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	102	Arsenic acid						REACH(SVHC)
			C	All applications	—	—		
	103	Calcium arsenate						REACH(SVHC)
			C	All applications	—	—		
	104	N,N-dimethylacetamide [DMAC]						REACH(SVHC)
			C	All applications	—	—		
	105	2,2'-dichloro-4,4'-methylenedianiline [MOCA]						REACH(SVHC)
			C	All applications	—	—		
	106	Phenolphthalein						REACH(SVHC)
			C	All applications	—	—		
	107	Other chlorine compounds *11						
			C	All applications	—	—		
	108	1,2-bis(2-methoxyethoxy)ethane [TEGDME, triglyme]						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	109	1,2-dimethoxyethane; ethylene glycol dimethyl ether [EGDME]						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	110	Diboron trioxide						IEC62474 *12 REACH(SVHC)
			C	All applications	—	—		
	111	Formamide						REACH(SVHC)
			C	All applications	—	—		
	112	TGIC (1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)						REACH(SVHC)
			C	All applications	—	—		
	113	β-TGIC (1,3,5-tris(2S and 2R)-2,3-epoxypropyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)						REACH(SVHC)
			C	All applications	—	—		
	114	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)						REACH(SVHC)
			C	All applications	—	—		
	115	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)						REACH(SVHC)
		C	All applications	—	—			
116	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)						REACH(SVHC)	
		C	All applications	—	—			
117	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)						IEC62474 *12 REACH(SVHC)	
		C	All applications	—	—			
118	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol						REACH(SVHC)	
		C	All applications	—	—			
119	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)						REACH(SVHC)	
		C	All applications	—	—			
120	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)						*9 US-TSCA REACH(SVHC)	
		B	All applications	—	—			
121	Pentacosafuorotridecanoic acid						REACH(SVHC)	
		C	All applications	—	—			
122	Tricosafuorododecanoic acid						REACH(SVHC)	
		C	All applications	—	—			
123	Henicosafuoroundecanoic acid						REACH(SVHC)	
		C	All applications	—	—			
124	Heptacosafuorotetradecanoic acid						REACH(SVHC)	
		C	All applications	—	—			
125	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated - covering well-defined substances and UVCB substances, polymers and homologues						REACH(SVHC)	
		C	All applications	—	—			
126	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]						REACH(SVHC)	
		C	All applications	—	—			
127	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))						REACH(SVHC)	
		C	All applications	—	—			
128	Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA)						REACH(SVHC)	
		C	All applications	—	—			
129	Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride						REACH(SVHC)	
		C	All applications	—	—			

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Others	130	Methoxy acetic acid					
			C	All applications	—	—	REACH(SVHC)
	131	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	132	Diisopentylphthalate (DIPP)					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	133	N-pentyl-isopentylphthalate					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	134	1,2-Diethoxyethane					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	135	N,N-dimethylformamide; dimethyl formamide					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	136	Pyrochlore, antimony lead yellow					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	137	Silicic acid, barium salt, lead-doped					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	138	Furan					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	139	Propylene oxide; 1,2-epoxypropane; methyloxirane					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	140	Diethyl sulphate					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	141	Dimethyl sulphate					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	142	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	143	Dinoseb					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	144	4,4'-methylenedi-o-toluidine					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	145	4,4'-oxydianiline and its salts					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	146	4-Aminoazobenzene; 4-Phenylazoaniline					IEC62474 *12
			C	All applications	—	—	REACH(SVHC)
	147	4-methyl-m-phenylenediamine (2,4-toluene-diamine)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	148	6-methoxy-m-toluidine (p-cresidine)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	149	Biphenyl-4-ylamine					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	150	o-aminoazotoluene					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	151	o-Toluidine; 2-Aminotoluene					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	152	N-methylacetamide					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	153	1-bromopropane; n-propyl bromide					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	154	Dipentyl phthalate (DPP)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	155	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	156	APFO(Ammonium pentadecafluorooctanoate)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	157	PFOA(Pentadecafluorooctanoic acid)					REACH (Restriction) *9
			B	Intentional use			
				PFOA and its salts	25ppb (0,025ppm)		
				Total concentration of PFOA related substances	1000ppb (1ppm)		
	158	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	159	Disodium 4-amino-3-[[4'-(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	160	Dihexyl phthalate					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	161	Imidazolidine-2-thione; (2-imidazoline-2-thiol)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	162	Trixylyl phosphate					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	163	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	164	Sodium perborate; perboric acid, sodium salt					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	165	Sodium peroxometaborate					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	166	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	167	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)					REACH (Authorization)
			C	All applications	—	—	REACH (Authorization)
	168	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)
	169	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)					REACH(SVHC)
			C	All applications	—	—	REACH(SVHC)

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Others	170	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters with $\geq 0.3\%$ of dihexyl phthalate (EC No.201-559-5)					REACH (Authorization)
			C	All applications			
	171	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]					REACH (Authorization)
			C	All applications			
	172	1,3-propanesultone					REACH(SVHC)
			C	All applications			
	173	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol(UV-327)					REACH (Authorization)
			C	All applications			
	174	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol(UV-350)					REACH (Authorization)
			C	All applications			
	175	Nitrobenzene					REACH(SVHC)
			C	All applications			
	176	Perfluorononan-1-oicacid and its sodium and ammonium salts					REACH(SVHC)
			C	All applications			
	177	Benzo[def]chrysene (Benzo[a]pyrene)					REACH(SVHC)
			C	All applications			
	178	4,4'-isopropylidenediphenol (bisphenol A; BPA)					REACH(SVHC)
			C	All applications			
	179	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts					REACH(SVHC)
			C	All applications			
	180	p-(1,1-dimethylpropyl)phenol					REACH(SVHC)
			C	All applications			
	181	4-heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]					REACH(SVHC)
			C	All applications			
	182	4,4'-isopropylidenediphenol (bisphenol A; BPA)					REACH(SVHC)
			C	All applications			
	183	Perfluorohexane-1-sulphonic acid and its salts					REACH(SVHC)
			C	All applications			
	184	Chrysene					REACH(SVHC)
			C	All applications			
	185	Benz[a]anthracene					REACH(SVHC)
			C	All applications			
	186	Cadmium nitrate					REACH(SVHC)
			C	All applications			
	187	Cadmium hydroxide					REACH(SVHC)
			C	All applications			
	188	Cadmium carbonate					REACH(SVHC)
			C	All applications			
	189	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo [12.2.1.16.9.02,13.05,10] octadeca-7,15-diene ("Dechlorane Plus™") [covering any of its individual anti- and syn-isomers or any combination thereof]					*14 CEPA REACH(SVHC)
			C	All applications			
	190	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with 0.1% w/w 4-heptylphenol, branched and linear]					REACH(SVHC)
			C	All applications			
	191	Octamethylcyclotetrasiloxane (D4)					REACH(SVHC)
			C	All applications			
	192	Decamethylcyclopentasiloxane (D5)					REACH(SVHC)
			C	All applications			
	193	Dodecamethylcyclohexasiloxane (D6)					REACH(SVHC)
			C	All applications			
	194	Disodium octaborate					REACH(SVHC)
			C	All applications			
195	Benzo[ghi]perylene					REACH(SVHC)	
		C	All applications				
196	Terphenyl hydrogenated					REACH(SVHC)	
		C	All applications				
197	Ethylenediamine					REACH(SVHC)	
		C	All applications				
198	2,2-bis(4'-hydroxyphenyl)-4-methylpentane					REACH(SVHC)	
		C	All applications				
199	Benzo[k]fluoranthene					REACH(SVHC)	
		C	All applications				
200	Fluoranthene					REACH(SVHC)	
		C	All applications				
201	Phenanthrene					REACH(SVHC)	
		C	All applications				
202	Pyrene					REACH(SVHC)	
		C	All applications				
203	2-methoxyethyl acetate					REACH(SVHC)	
		C	All applications				
204	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ? 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)					REACH(SVHC)	
		C	All applications				
205	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides (covering any of their individual isomers and combinations thereof)					REACH(SVHC)	
		C	All applications				
206	4-tert-butylphenol					REACH(SVHC)	
		C	All applications				
207	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone					REACH(SVHC)	
		C	All applications				
208	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one					REACH(SVHC)	
		C	All applications				
209	Diisohexyl phthalate					REACH(SVHC)	
		C	All applications				
210	Perfluorobutane sulfonic acid (PFBS) and its salts					REACH(SVHC)	
		C	All applications				

Classification	No.	Substance group	Rank	Applications	Threshold value *1	Date of restriction	Remarks
Others	211	6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepine 3-oxide	B	All applications	—	—	*9
			C	All applications	—	—	
	212	Sodium Pentachlorophenate	B	All applications	—	—	*9
	213	Phenol, Isopropylated Phosphate (3:1) (PIP 3:1)	C	All applications	—	—	*15 US-TSCA
			C	All applications	—	—	
	214	2,4,6-tris(tert-butyl)phenol (2,4,6-TTBP)	B	All applications	—	—	US-TSCA
	215	Pentachlorothiophenol (PCTP)	B	All applications	—	—	US-TSCA
			C	All applications	—	—	
	216	per-and polyfluoroalkyl substances(PFAS)	C	All applications	—	—	US-TSCA
			C	All applications	—	—	
	217	1-vinylimidazole	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	218	2-methylimidazole	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	219	Butyl 4-hydroxybenzoate	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	220	Dibutylbis(pentane-2,4-dionato-O,O')tin	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	221	bis(2-(2-methoxyethoxy)ethyl) ether	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	222	Diocetyl tin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	223	1,4-dioxane	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	224	2,2-bis(bromomethyl)propane 1,3-diol(BMP);2,2dimethylpropan 1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA);2,3-dibromo-1-propanol (2,3-DBPA)	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	225	2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	226	4,4'-(1-methylpropylidene)bisphenol; (bisphenol B)	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	227	Glutaral	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	228	Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	229	Orthoboric acid, sodium salt	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	230	Phenol, alkylation products (mainly in para position) with C12-rich branched or linear alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP)	C	All applications	—	—	REACH(SVHC)
			C	All applications	—	—	
	231	Decabromo-diphenyl-ethane(DBDPE)	C	All applications	—	—	*14 CEPA
			C	All applications	—	—	

Note1: The present guidelines include the latest information of European RoHS directives as of January 2019.

Note2: The present guidelines apply to packing materials used for products released to our customers but do not apply to packaging and packing material used for products delivered to our company (see page 3 of the guideline for packaging and packing material of delivered products.)

Note3: This does not apply to non-radioactive reagents for measurement, analysis or research.

Note4: This does not apply to substances enclosed hermetically in a piece of equipment, a device or a fixture at any stage during purchase, use and disposal.

Note5: Typical materials that belong to each material classification are listed on attached table 5 in this table

Note6: So we will be an increase in substances of very high concern (SVHC), in the European REACH Regulation, it may at the time have been formally identified, contact you via surveys to conduct research about substance not listed in this guideline in the future. In addition, more information, please check the website at the European Chemicals Agency. (<http://echa.europa.eu/>)

- \*1: Intentional use of prohibited materials (rank B) is not acceptable. However, lead intentionally used for electroless plating is acceptable if it is controlled to the threshold value of 1000 ppm. Impurities more than the threshold value is prohibited per each part of components. (Please refer the chart on page 5.)
- \*2: For packaging and packing material subject to Note 2, the total content of four heavy metals (cadmium, lead, mercury, and hexavalent chromium compounds) shall not exceed 100 ppm.
- \*3: Threshold of heavy metals in battery are listed the below;  
Cadmium: 0.0005wt% (per total weight of battery)  
Lead: 0.002wt% (per total weight of battery)  
Mercury: 0.004wt% (per total weight of battery)
- \*4: Nickel compounds except for metal alloys (for example: stainless steel).
- \*5: Prohibition applies to short chain chlorinated paraffins with carbon numbers from 10 to 13.
- \*6: Brominated flame retardant except for PBBs and PBDEs. Indicate with ISO code 1043-4 or CAS No.
- \*7: Specific amines are listed in Table 3.
- \*8: "Toxic substances, production of which is prohibited "under Article 16 of the Industrial Safety and Health Law.
- \*9: "Class I specified chemical substance" prescribed in Article 1, Enforcement Ordinance of Law Concerning Examination and Regulation of Manufacture and Handling of Chemical Substances
- \*10: Each substance is regulated by the European Union REACH Regulation described in table 2 "remarks" as below. Authorized substances or candidates for authorization are described as "REACH (Authorized)", restricted substances are described as "REACH (Restricted)", and substances of very high concern are described as "REACH (SVHC)".
- \*11: "Other chlorine compounds" indicate chlorine compounds except "No.1-6,8,9 listed in Table 1" and "No.9,19-21,23,29, 35-38, 41-46,49-52,54-58,61,64,67,90,96,101".
- \*12: Material that has been described as "IEC62474" in the chemical group remarks column of Table 2 is a substance that is specified in the IEC62474 (International Electrotechnical Commission).
- \*13: Specified eight substances to B rank in Polycyclic aromatic hydrocarbons may be contained carbon black using as coloring agent for resin product.
- \*14: CEPA: Canadian Environmental Protection Act
- \*15: Substance No. 213(Phenol, Isopropylated Phosphate (3:1) (PIP 3:1)) may be prohibited by U.S. TSCA PBT regulations after March 8, 2022. In this case, the substance is ranked B in this guideline.

[Table 3] List of Specific Amines

The term "specific amines" refers to amine compounds to which the Council Directive amending 76/769/EEC for the 19th time applies.

Substance	Chemical formula	CAS No
4-aminoazobenzene	C <sub>12</sub> H <sub>11</sub> N <sub>3</sub>	60-09-3
0-anisidine	C <sub>7</sub> H <sub>9</sub> NO	90-04-0
2-naphtylamine	C <sub>10</sub> H <sub>9</sub> N	91-59-8
3,3'-dichlorobenzidine	C <sub>12</sub> H <sub>10</sub> Cl <sub>2</sub> N <sub>2</sub>	91-94-1
4-aminobiphenyl	C <sub>12</sub> H <sub>11</sub> N	92-67-1
Benzidine	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub>	92-87-5
o-toluidine	C <sub>7</sub> H <sub>9</sub> N	95-53-4
4-chloro-2-metyl aniline	C <sub>7</sub> H <sub>8</sub> ClN	95-69-2
2,4-toluendiamine	C <sub>7</sub> H <sub>10</sub> N <sub>2</sub>	95-80-7
o-aminoazotoluene	C <sub>14</sub> H <sub>15</sub> N <sub>3</sub>	97-56-3
5-nitro-o-toluidine	C <sub>7</sub> H <sub>8</sub> N <sub>2</sub> O <sub>2</sub>	99-55-8
3,3'-dichloro-4,4'-diamino diphenylmethane	C <sub>13</sub> H <sub>12</sub> Cl <sub>2</sub> N <sub>2</sub>	101-14-4
4,4'-methylenedianiline	C <sub>13</sub> H <sub>14</sub> N <sub>2</sub>	101-77-9
4,4'-diaminodiphenylether	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> O	101-80-4
p-chloroaniline	C <sub>6</sub> H <sub>6</sub> ClN	106-47-8
3,3'-dimethoxybenzidine	C <sub>14</sub> H <sub>16</sub> N <sub>2</sub> O <sub>2</sub>	119-90-4
3,3'-dimethylbenzidine	C <sub>14</sub> H <sub>16</sub> N <sub>2</sub>	119-93-7
2-methoxy-5-methyl aniline	C <sub>8</sub> H <sub>11</sub> NO	120-71-8
2,4,5-trimethylaniline	C <sub>9</sub> H <sub>13</sub> N	137-17-7
4,4'-thiodianiline	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> S	139-65-1
2,4-diaminoanisole	C <sub>7</sub> H <sub>10</sub> N <sub>2</sub> O	615-05-4
4,4'-diamino-3,3'-dimethyl-diphenylmethane	C <sub>15</sub> H <sub>18</sub> N <sub>2</sub>	838-88-0

[Table 4] List of Ozone Depleting Substances

Class	Substance Classification No.	Substance	Breakdown	Chemical Formula
Class I	C04097	CFCs (Annex A Group I substances in the Montreal Protocol)	CFC-11	CFCl <sub>3</sub>
			CFC-12	CF <sub>2</sub> Cl <sub>2</sub>
			CFC-113	C <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub>
			CFC-114	C <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub>
			CFC-115	C <sub>2</sub> F <sub>5</sub> Cl
	C04098	Halons (Annex A Group II substances in the Montreal Protocol)	Halon 1211	CF <sub>2</sub> BrCl
			Halon 1301	CF <sub>3</sub> Br
			Halon 2402	C <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>
	C04099	Other CFCs (Annex B Group I substances in the Montreal Protocol)	CFC-13	CF <sub>3</sub> Cl
			CFC-111	C <sub>2</sub> FCl <sub>5</sub>
			CFC-112	C <sub>2</sub> F <sub>2</sub> Cl <sub>4</sub>
			CFC-211	C <sub>3</sub> FCl <sub>7</sub>
			CFC-212	C <sub>3</sub> F <sub>2</sub> Cl <sub>6</sub>
			CFC-213	C <sub>3</sub> F <sub>3</sub> Cl <sub>5</sub>
			CFC-214	C <sub>3</sub> F <sub>4</sub> Cl <sub>4</sub>
			CFC-215	C <sub>3</sub> F <sub>5</sub> Cl <sub>3</sub>
			CFC-216	C <sub>3</sub> F <sub>6</sub> Cl <sub>2</sub>
	C04100	Carbon tetrachloride (Annex B Group II substance in the Montreal Protocol)	Carbon tetrachloride	CCl <sub>4</sub>
	C04101	1,1,1-trichloroethane (Annex B Group III substance in the Montreal Protocol)	1,1,1-trichloroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>
	C04102	Bromochloromethane (Annex C Group III substance in the Montreal Protocol)	Bromochloromethane	CH <sub>2</sub> BrCl
	C04103	Methyl bromide (Annex E substance in the Montreal Protocol)	Methyl bromide	CH <sub>3</sub> Br
	C04104	HBFCs (Annex C Group II substances in the Montreal Protocol)	Dibromofluoromethane	CHFBr <sub>2</sub>
			Bromodifluoromethane	CHF <sub>2</sub> Br
			Bromofluoromethane	CH <sub>2</sub> FBr
			Tetrabromofluoroethane	C <sub>2</sub> H <sub>2</sub> FBr <sub>4</sub>
			Tribromodifluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>3</sub>
			Dibromotrifluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Br <sub>2</sub>
			Bromotetrafluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> Br
			Tribromofluoroethane	C <sub>2</sub> H <sub>2</sub> FBr <sub>3</sub>
			Dibromodifluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>2</sub>
			Bromotrifluoroethane	C <sub>2</sub> H <sub>2</sub> F <sub>3</sub> Br
			Dibromofluoroethane	C <sub>2</sub> H <sub>3</sub> FBr <sub>2</sub>
			Bromodifluoroethane	C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Br
			Bromofluoroethane	C <sub>2</sub> H <sub>4</sub> FBr
			Hexabromofluoropropane	C <sub>3</sub> H <sub>2</sub> FBr <sub>6</sub>
			Pentabromodifluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>5</sub>
			Tetrabromotrifluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>3</sub> Br <sub>4</sub>
			Tribromotetrafluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Br <sub>3</sub>
			Dibromopentafluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Br <sub>2</sub>
			Bromohexafluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub> Br
			Pentabromofluoropropane	C <sub>3</sub> H <sub>2</sub> FBr <sub>5</sub>
			Tetrabromodifluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>2</sub> Br <sub>4</sub>
			Tribromotrifluoropropane	C <sub>3</sub> H <sub>2</sub> F <sub>3</sub> Br <sub>3</sub>
Dibromotetrafluoropropane			C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>	
Bromopentafluoropropane			C <sub>3</sub> H <sub>2</sub> F <sub>5</sub> Br	
Tetrabromofluoropropane			C <sub>3</sub> H <sub>3</sub> FBr <sub>4</sub>	
Tribromodifluoropropane			C <sub>3</sub> H <sub>3</sub> F <sub>2</sub> Br <sub>3</sub>	
Dibromotrifluoropropane			C <sub>3</sub> H <sub>3</sub> F <sub>3</sub> Br <sub>2</sub>	
Bromotetrafluoropropane			C <sub>3</sub> H <sub>3</sub> F <sub>4</sub> Br	
Tribromofluoropropane			C <sub>3</sub> H <sub>4</sub> FBr <sub>3</sub>	
Dibromodifluoropropane			C <sub>3</sub> H <sub>4</sub> F <sub>2</sub> Br <sub>2</sub>	
Bromotrifluoropropane			C <sub>3</sub> H <sub>4</sub> F <sub>3</sub> Br	
Dibromofluoropropane			C <sub>3</sub> H <sub>5</sub> FBr <sub>2</sub>	
Bromodifluoropropane			C <sub>3</sub> H <sub>5</sub> F <sub>2</sub> Br	
Bromofluoropropane	C <sub>3</sub> H <sub>6</sub> FBr			
Bromochloromethane	CH <sub>2</sub> BrCl			
Class II	C04105	HCFCs (Annex C Group I substances in the Montreal Protocol)	HCFC-21	CHFCl <sub>2</sub>
			HCFC-22	CHF <sub>2</sub> Cl
			HCFC-31	CH <sub>2</sub> FCl
			HCFC-121	C <sub>2</sub> HFCl <sub>4</sub>
			HCFC-122	C <sub>2</sub> HF <sub>2</sub> Cl <sub>3</sub>
			HCFC-123	C <sub>2</sub> HF <sub>3</sub> Cl <sub>2</sub>
			HCFC-123*1	CHCl <sub>2</sub> CF <sub>3</sub>
			HCFC-124	C <sub>2</sub> HF <sub>4</sub> Cl
			HCFC-124*1	CHFClCF <sub>3</sub>
			HCFC-131	C <sub>2</sub> H <sub>2</sub> FCl <sub>3</sub>
			HCFC-132	C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Cl <sub>2</sub>

Class	Substance Classification No.	Substance	Breakdown	Chemical Formula
Class II	C04105	HCFCs (Annex C Group I substances in the Montreal Protocol)	HCFC-133	C2H2F3Cl
			HCFC-141	C2H3FCI2
			HCFC-141b*1	CH3CFCI2
			HCFC-142	C2H3F2CI
			HCFC-142b*1	CH3CF2CI
			HCFC-151	C2H4FCI
			HCFC-221	C3HFCI6
			HCFC-222	C3HF2CI5
			HCFC-223	C3HF3CI4
			HCFC-224	C2HF4CI3
			HCFC-225	C3HF5CI2
			HCFC-225ca*1	CF3CF2CHCI2
			HCFC-225cb*1	CF2CICF2CHCIF
			HCFC-226	C3HF6CI
			HCFC-231	C3H2FCI5
			HCFC-232	C3H2F2CI4
			HCFC-233	C3H2F3CI3
			HCFC-234	C3H2F4CI2
			HCFC-235	C3H2F5CI
			HCFC-241	C3H3FCI4
			HCFC-242	C3H3F2CI3
			HCFC-243	C3H3F3CI2
			HCFC-244	C3H3F4CI
			HCFC-251	C3H4FCI3
			HCFC-252	C3H4F2CI2
			HCFC-253	C3H4F3CI
			HCFC-261	C3H5FCI2
HCFC-262	C3H5F2CI			
HCFC-271	C3H6FCI			

\*1: Substances most likely to be used commercially.

[Table 5-1] Breakdown List of Substances (Metal compounds)

Classification	Substance Group	Substance	Chemical Formula	CAS No.	
Metal compounds	Cadmium and cadmium compounds	Cadmium	Cd	7440-43-9	
		Cadmium oxide	CdO	1306-19-0	
		Cadmium sulfide	CdS	1306-23-6	
		Cadmium chloride	CdCl <sub>2</sub>	10108-64-2	
		Cadmium sulfate	CdSO <sub>4</sub>	10124-36-4	
		Other cadmium compounds	—	—	
	Hexavalent chromium compounds	Sodium dichromate	Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	10588-01-9	
		Chromium (VI) oxide	CrO <sub>3</sub>	1333-82-0	
		Calcium chromate	CaCrO <sub>4</sub>	13765-19-0	
		Lead (II) chromate	PbCrO <sub>4</sub>	7758-97-6	
		Potassium dichromate	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	7778-50-9	
		Potassium chromate	K <sub>2</sub> CrO <sub>4</sub>	7789-00-6	
		Barium chromate	BaCrO <sub>4</sub>	10294-40-3	
		Sodium chromate	Na <sub>2</sub> CrO <sub>4</sub>	7775-11-3	
		Strontium chromate	SrCrO <sub>4</sub>	7789-06-2	
		Other hexavalent chromium compounds	—	—	
		Lead and lead compounds	Lead	Pb	7439-92-1
	Lead (II) carbonate		PbCO <sub>3</sub>	598-63-0	
	Lead (IV) oxide		PbO <sub>2</sub>	1309-60-0	
	Lead (II, IV) oxide		Pb <sub>3</sub> O <sub>4</sub>	1314-41-6	
	Lead (II) sulfide		PbS	1314-87-0	
	Lead (II) oxide		PbO	1317-36-8	
	Lead (II) carbonate basic		2PbCO <sub>3</sub> ·Pb(OH) <sub>2</sub>	1319-46-6	
	Lead hydroxycarbonate		2PbCO <sub>3</sub> ·Pb(OH) <sub>2</sub>	1344-36-1	
	Lead (II) sulfate		PbSO <sub>4</sub>	7446-14-2	
	Lead (II) phosphate		Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	7446-27-7	
	Lead (II) chromate		PbCrO <sub>4</sub>	7758-97-6	
	Lead (II) titanate		PbTiO <sub>3</sub>	12060-00-3	
	Lead sulfate, sulfuric acid, lead salt		PbXSO <sub>4</sub>	15739-80-7	
	Lead sulfate, tribasic		PbSO <sub>4</sub> ·H <sub>2</sub> O	12202-17-4	
	Lead stearate		Pb(C <sub>17</sub> H <sub>35</sub> COO) <sub>2</sub>	1072-35-1	
	Lead stearate, dibasic		2PbO·	56189-09-4	
	Lead acetate		C <sub>4</sub> H <sub>6</sub> O <sub>4</sub> Pb / (CH <sub>3</sub> COO) <sub>2</sub> Pb	301-04-2	
	Lead (II) acetate, trihydrate		Pb(CH <sub>3</sub> COO) <sub>2</sub> ·3H <sub>2</sub> O	6080-56-4	
	Lead selenide		PbSe	12069-00-0	
	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)		—	12656-85-8	
	Lead sulfochromate yellow (C.I. Pigment Yellow 34)		—	1344-37-2	
	Lead arsenate		Pb <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>	3687-31-8	
	Lead Hydrogen Arsenate		AsHO <sub>4</sub> Pb	7784-40-9	
	Other lead compounds		—	—	
	Mercury and mercury compounds		Mercury	Hg	7439-97-6
			Mercury (II) chloride	HgCl <sub>2</sub>	7487-94-7
			Mercury (II) oxide	HgO	21908-53-2
		Mercuric Chloride	—	33631-63-9	
		Mercury sulphate	HgSO <sub>4</sub>	7783-35-9	
		Mercury (II) nitrate; Mercuric	HgN <sub>2</sub> O <sub>6</sub> / Hg(NO <sub>3</sub> ) <sub>2</sub>	10045-94-0	
		Mercury(II) sulfide; Mercury sulfide (HgS)	HgS	1344-48-5	
Other mercury compounds		—	—		
Bis (tri-n-butyltin) oxide (TBTO)	Bis (tri-n-butyltin) oxide	O(Sn(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> ) <sub>2</sub>	56-35-9		
Triphenyltins (TBTs) and triphenyltins (TPTs)	Triphenyltin N,N''-	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn(CH <sub>3</sub> ) <sub>2</sub> NCS	1803-12-9		
	Triphenyltin fluoride	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnF	379-52-2		
	Triphenyltin acetate	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>	900-95-8		
	Triphenyltin chloride	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnCl	639-58-7		
	Triphenyltin hydroxide	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOH	76-87-9		
	Triphenyltin fatty acid salts (C = 9 to 11)	—	47672-31-1		
	Triphenyltin chloroacetate	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>2</sub> Cl	7094-94-2		
	Tributyltin methacrylate	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>4</sub> H <sub>5</sub> O <sub>2</sub>	2155-70-6		
	Bis (tributyltin) fumarate	C <sub>2</sub> H <sub>2</sub> (COO) <sub>2</sub> ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> ) <sub>2</sub>	6454-35-9		
	Tributyltin fluoride	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnF	1983-10-4		
	Bis (tributyltin) 2,3-dibromosuccinate	((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub> C <sub>2</sub> H <sub>2</sub> (Br) <sub>2</sub>	31732-71-5		
	Tributyltin acetate	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>	56-36-0		
	Tributyltin laurate	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>12</sub> H <sub>23</sub> O <sub>2</sub>	3090-36-6		
	Bis (tributyltin) phthalate	(C <sub>6</sub> H <sub>4</sub> )(COO) <sub>2</sub> ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> ) <sub>2</sub>	4782-29-0		
	Copolymer of alkyl acrylate, methyl methacrylate and tributyltin methacrylate (alkyl; C = 8)	—	—		
	Tributyltin sulfamate	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnSO <sub>3</sub> NH <sub>2</sub>	6517-25-5		
	Bis (tributyltin) maleate	C <sub>2</sub> H <sub>2</sub> (COO) <sub>2</sub> ((C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> ) <sub>2</sub>	14275-57-1		
	Tributyltin chloride	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnCl	1461-22-9		

Classification	Substance Group	Substance	Chemical Formula	CAS No.
Metal compounds	Tributyltins (TBTs) and triphenyltins (TPTs)	Mixture of tributyltin cyclopentane-carboxylate and its analogs	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnCO <sub>3</sub> C <sub>5</sub> H <sub>9</sub>	—
		Mixture of tributyltin 1, 2, 3, 4, 4a, 4b, 5, 6, 10, 10a-decahydro-7-isopropyl-1, 4a-dimethyl-1-phenanthrenecarboxylate and its analogs (Tributyltin rosin salt)	—	—
		Other tributyltins and triphenyltins	—	—
Organotin compounds other than Bis (tri-n-butyltin) oxide (TBTO), Tributyltins (TBTs) and triphenyltins (TPTs)	Dibutyltin oxide	C <sub>8</sub> H <sub>18</sub> O <sub>2</sub> Sn	818-08-6	
	Dibutyltin dichloride	C <sub>8</sub> H <sub>18</sub> Cl <sub>2</sub> Sn	683-18-1	
	Dibutyltin dilaurate	C <sub>32</sub> H <sub>64</sub> O <sub>4</sub> Sn	77-58-7	
	Dibutyltin bis(benzyl maleate)	C <sub>30</sub> H <sub>36</sub> O <sub>8</sub> Sn	7324-74-5	
	Dibutyltin maleate	C <sub>12</sub> H <sub>20</sub> O <sub>4</sub> Sn	1978-4-6	
	Dibutyltin di(acetate)	C <sub>12</sub> H <sub>24</sub> O <sub>4</sub> Sn	1067-33-0	
	Diocetyl tin oxide	C <sub>16</sub> H <sub>34</sub> O <sub>2</sub> Sn	870-08-6	
	Diocetyl tin dichloride	C <sub>16</sub> H <sub>34</sub> Cl <sub>2</sub> Sn	3542-36-7	
	Diocetyl tin maleate	C <sub>20</sub> H <sub>36</sub> O <sub>4</sub> Sn	16091-18-2	
	Di(n-octyl)tin bis(isooctylthioglycolate)	C <sub>36</sub> H <sub>72</sub> O <sub>4</sub> S <sub>2</sub> Sn	26401-97-8	
	Diocetyl tin dilaurates (DOTL)	C <sub>40</sub> H <sub>80</sub> O <sub>4</sub> Sn	3648-18-8	
Antimony and antimony compounds	Antimony	Sb	7440-36-0	
	Antimony trichloride	SbCl <sub>3</sub>	10025-91-9	
	Antimony trioxide	Sb <sub>2</sub> O <sub>3</sub>	1309-64-4	
	Antimony pentoxide	Sb <sub>2</sub> O <sub>5</sub>	1314-60-9	
	Sodium antimonite	Na <sub>3</sub> O <sub>4</sub> Sb	15432-85-6	
	Other antimony compounds	—	—	
Arsenic and arsenic compounds	Arsenic	As	7440-38-2	
	Gallium arsenide	GaAs	1303-00-0	
	Arsenic pentoxide	As <sub>2</sub> O <sub>5</sub>	1303-28-2	
	Arsenic trioxide	As <sub>2</sub> O <sub>3</sub>	1327-53-3	
	Calcium arsenate	Ca <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>	7778-44-1	
	Calcium arsenite	Ca <sub>3</sub> (AsO <sub>3</sub> ) <sub>2</sub>	27152-57-4	
	Potassium arsenite	KAsO <sub>2</sub> .HAsO <sub>2</sub>	10124-50-2	
	Potassium arsenate	KH <sub>2</sub> AsO <sub>4</sub>	7784-41-0	
	Lead arsenate	Pb <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>	3687-31-8	
	Lead Hydrogen Arsenate	AsHO <sub>4</sub> Pb	7784-40-9	
	Other arsenic compounds	—	—	
Beryllium and beryllium compounds	Beryllium	Be	7440-41-7	
	Beryllium oxide	BeO	1304-56-9	
	Beryllium-aluminum alloy	Unspecified	12770-50-2	
	Beryllium chloride	BeCl <sub>2</sub>	7787-47-5	
	Beryllium fluoride	BeF <sub>2</sub>	7787-49-7	
	Beryllium hydroxide	Be(OH) <sub>2</sub>	13327-32-7	
	Beryllium phosphate	Be <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	13598-15-7	
	Beryllium sulfate	BeSO <sub>4</sub>	13510-49-1	
	Beryllium sulfate tetrahydrate	BeSO <sub>4</sub> ·4H <sub>2</sub> O	7787-56-6	
	Beryl ore	Be <sub>3</sub> Al <sub>2</sub> Si <sub>6</sub> O <sub>18</sub>	1302-52-9	
	Other beryllium compounds	—	—	
Bismuth and bismuth compounds	Bismuth	Bi	7440-69-9	
	Bismuth trioxide	Bi <sub>2</sub> O <sub>3</sub>	1304-76-3	
	Bismuth nitrate	BiN <sub>3</sub> O <sub>9</sub>	10361-44-1	
	Other bismuth compounds	—	—	
Nickel and nickel compounds *2	Nickel (II) oxide	NiO	1313-99-1	
	Nickel (II) carbonate	NiCO <sub>3</sub>	3333-67-3	
	Nickel (II) sulfate	NiSO <sub>4</sub>	7786-81-4	
	Nickel	Ni	7440-02-0	
	Other nickel compounds	—	—	
Selenium and selenium compounds	Selenium	Se	7782-49-2	
	Selenous acid	H <sub>2</sub> SeO <sub>3</sub>	7783-00-8	
	Hydrogen selenide	H <sub>2</sub> Se	7783-7-5	
	Sodium selenide	Na <sub>2</sub> Se	1313-85-5	
	Selenium oxide	SeO	12640-89-0	
	Sodium selenate	Na <sub>2</sub> SeO <sub>4</sub>	10112-94-4	
	Dimethyl selenide	(CH <sub>3</sub> ) <sub>2</sub> Se	593-79-3	
	Selenium dioxide	SeO <sub>2</sub>	7446-8-4	
	Other selenium compounds	—	—	
Thallium and thallium compounds	Thallium	Tl	7440-28-0	
	Thallium nitrate	TlNO <sub>3</sub>	10102-45-1	
	Thallium acetate	TlCH <sub>3</sub> COO	563-68-8	
	Thallium carbonate	Tl <sub>2</sub> CO <sub>3</sub>	6533-73-9	
	Thallium sulfate	Tl <sub>2</sub> SO <sub>4</sub>	7446-18-6	

\*1: Nickel compounds except for metal alloys (for example: stainless steel)

[Table 5-2] Breakdown List of Substances (Halogenated organic compounds)

Classification	Substance Group	Substance	Chemical Formula	CAS No.	
Halogenated organic compounds	Polybrominated biphenyls (PBBs)	Polybrominated biphenyls	C12HXBr(10-X)	—	
		2-Bromobiphenyl	C12H9Br	2052-7-5	
		3-Bromobiphenyl	C12H9Br	2113-57-7	
		4-Bromobiphenyl	C12H9Br	92-66-0	
		Dibromobiphenyl	C12H8Br2	92-86-4	
		Tribromobiphenyl	C12H7Br3	59080-34-1	
		Tetrabromobiphenyl	C12H6Br4	40088-45-7	
		Pentabromobiphenyl	C12H5Br5	56307-79-0	
		Hexabromobiphenyl	C12H4Br6	59080-40-9	
		Hexabromo-1,1'-biphenyl	C12H4Br6	36355-01-8	
		Heptabromobiphenyl	C12H3Br7	35194-78-6	
		Octabromobiphenyl	C12H2Br8	61288-13-9	
		Nonabromo-1,1'-biphenyl	C12HBr9	27753-52-2	
		Decabromobiphenyl	C12Br10	13654-09-6	
		Other polybrominated biphenyls	—	—	
	Polybrominated diphenyl	Polybrominated diphenyl ethers	C12HXBr(10-X)O	—	
		Decabromodiphenyl ether	C12Br10O	1163-19-5	
		Octabromodiphenyl ether	C12H2Br8O	32536-52-0	
		Hexabromodiphenyl ether	C12H4Br6O	36483-60-0	
		Pentabromodiphenyl ether	C12H5Br5O	32534-81-9	
		Bromodiphenyl ether	C12H9BrO	101-55-3	
		Dibromodiphenyl ether	C12H8Br2O	2050-47-7	
		Tribromodiphenyl ether	C12H7Br3O	49690-94-0	
		Tetrabromodiphenyl ether	C12H6Br4O	40088-47-9	
		Heptabromodiphenyl ether	C12H3Br7O	68928-80-3	
		Nonabromodiphenyl ether	C12HBr9O	63936-56-1	
		Other polybrominated diphenyl ethers	—	—	
		Polychlorinated biphenyls (PCBs)	Polychlorinated biphenyls	Unspecified	1336-36-3
			Polychlorinated terphenyls	Unspecified	61788-33-8
	Other PCBs		—	—	
	Polychlorinated naphthalenes (Cl <sup>3</sup> 3)	Polychlorinated naphthalenes (Cl <sup>3</sup> 3)	Unspecified	70776-03-3	
		Other polychlorinated naphthalenes (Cl <sup>3</sup> 3)	—	—	
	Short chain chlorinated paraffins	Chlorinated paraffins (C10 Other short chain chlorinated paraffins to 13)	Unspecified	85535-84-8	
		Other short chain chlorinated paraffins	—	—	
	Brominated flame retardants *2	Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (14) [Aliphatic/alicyclic brominated compounds]	—	—	
		Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (15) [Aliphatic/alicyclic brominated compounds in combination with antimony compounds]	—	—	
		Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (16) [Aromatic brominated compounds (excluding brominated diphenyl ether and biphenyls)]	—	—	
		Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (17) [Aromatic brominated compounds (excluding brominated diphenyl ether and biphenyls) in combination with antimony compounds]	—	—	

Classification	Substance Group	Substance	Chemical Formula	CAS No.
Halogenated organic compounds	Brominated flame retardants *2	Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (22) [Aliphatic/alicyclic chlorinated and brominated compounds]	—	—
		Brominated flame retardant that falls under the notation of ISO 1043-4 code number FR (42) [Brominated organic phosphorous compounds]	—	—
		Poly (2,6-dibromo-phenylene oxide)	(C <sub>6</sub> H <sub>2</sub> Br <sub>2</sub> O) <sub>X</sub>	69882-11-7
		Tetradecabromo-diphenoxybenzene	C <sub>18</sub> Br <sub>14</sub> O <sub>2</sub>	58965-66-5
		1,2-bis (2,4,6-tribromo-phenoxy) ethane	C <sub>14</sub> H <sub>8</sub> Br <sub>6</sub> O <sub>2</sub>	37853-59-1
		3,5,3',5'-tetrabromo-bisphenol A (TBBA)	C <sub>15</sub> H <sub>12</sub> Br <sub>4</sub> O <sub>2</sub>	79-94-7
		TBBA, unspecified	—	30496-13-0
		TBBA-epichlorohydrin oligomer	(C <sub>15</sub> H <sub>12</sub> Br <sub>4</sub> O <sub>2</sub> .C <sub>3</sub> H <sub>5</sub> ClO) <sub>X</sub>	40039-93-8
		TBBA-diglycidyl-ether oligomer	—	70682-74-5
		TBBA carbonate oligomer	(C <sub>15</sub> H <sub>12</sub> Br <sub>4</sub> O <sub>2</sub> .CCl <sub>2</sub> O)	28906-13-0
		TBBA carbonate oligomer, phenoxy end capped	(C <sub>7</sub> H <sub>5</sub> O <sub>2</sub> )(C <sub>16</sub> H <sub>10</sub> Br <sub>4</sub> O <sub>3</sub> )	94334-64-2
		TBBA carbonate oligomer, 2,4,6-tribromophenol terminated	(C <sub>7</sub> H <sub>2</sub> Br <sub>3</sub> O <sub>3</sub> )(C <sub>16</sub> H <sub>10</sub> Br <sub>4</sub> )	71342-77-3
		TBBA-bisphenol A-phosgene polymer	(C <sub>15</sub> H <sub>16</sub> O <sub>2</sub> .C <sub>15</sub> H <sub>12</sub> Br <sub>4</sub> O <sub>2</sub> )	32844-27-2
		Brominated epoxy resin end-capped with tribromophenol	—	139638-58-7
		Brominated epoxy resin end-capped with tribromophenol	—	135229-48-0
		TBBA-(2,3-dibromo-propyl-ether)	C <sub>21</sub> H <sub>20</sub> Br <sub>8</sub> O <sub>2</sub>	21850-44-2
		TBBA bis-(2-hydroxy-ethyl-ether)	C <sub>19</sub> H <sub>20</sub> Br <sub>4</sub> O <sub>4</sub>	4162-45-2
		TBBA-bis-(allyl-ether)	C <sub>21</sub> H <sub>20</sub> Br <sub>4</sub> O <sub>2</sub>	25327-89-3
		TBBA-dimethyl-ether	C <sub>17</sub> H <sub>16</sub> Br <sub>4</sub> O <sub>2</sub>	37853-61-5
		Tetrabromo-bisphenol S	C <sub>12</sub> H <sub>6</sub> Br <sub>4</sub> O <sub>4</sub> S	39635-79-5
		TBBS-bis-(2,3-dibromo-propyl-ether)	C <sub>18</sub> H <sub>14</sub> Br <sub>8</sub> O <sub>4</sub> S	42757-55-1
		2,4-dibromo-phenol	C <sub>6</sub> H <sub>4</sub> Br <sub>2</sub> O	615-58-7
		2,4,6-tribromo-phenol	C <sub>6</sub> H <sub>3</sub> Br <sub>3</sub> O	118-79-6
		Pentabromo-phenol	C <sub>6</sub> HBr <sub>5</sub> O	608-71-9
		2,4,6-tribromo-phenyl-allyl-ether	C <sub>9</sub> H <sub>7</sub> Br <sub>3</sub> O	3278-89-5
		Tribromo-phenyl-allyl-ether, unspecified	C <sub>9</sub> H <sub>7</sub> Br <sub>3</sub> O	26762-91-4
		Hexabromo-cyclo-dodecane (HBCD), unspecified	C <sub>12</sub> H <sub>18</sub> Br <sub>6</sub>	3194-55-6
		Alpha-hexabromocyclododecane	C <sub>12</sub> H <sub>18</sub> Br <sub>6</sub>	134237-50-6
		Beta-hexabromocyclododecane	C <sub>12</sub> H <sub>18</sub> Br <sub>6</sub>	134237-51-7
		Gamma-hexabromocyclododecane	C <sub>12</sub> H <sub>18</sub> Br <sub>6</sub>	134237-52-8
		Tetrabromo-cyclo-octane	C <sub>8</sub> H <sub>12</sub> Br <sub>4</sub>	31454-48-5
		1,2-dibromo-4-(1,2 dibromo-methyl)-cyclo-hexane	C <sub>8</sub> H <sub>12</sub> Br <sub>4</sub>	3322-93-8
		Disodium tetrabromophthalate	C <sub>8</sub> Br <sub>4</sub> O <sub>4</sub> Na <sub>2</sub>	25357-79-3
		TBPA Na salt	C <sub>8</sub> Br <sub>4</sub> O <sub>3</sub>	632-79-1
		Tetrabromophthalic anhydride	C <sub>10</sub> H <sub>6</sub> Br <sub>4</sub> O <sub>4</sub>	55481-60-2
		Bis (methyl) tetrabromophthalate (C=6~23)	C <sub>24</sub> H <sub>34</sub> Br <sub>4</sub> O <sub>4</sub>	26040-51-7
		2-hydroxy-propyl-2-(2-hydroxy-ethoxy)-ethyl-TBP	C <sub>15</sub> H <sub>16</sub> Br <sub>4</sub> O <sub>7</sub>	20566-35-2
		TBPA, glycol-and propylene-oxide esters	—	75790-69-1
		N,N'-Ethylene -bis-(tetrabromophthalimide)	C <sub>18</sub> H <sub>4</sub> Br <sub>8</sub> N <sub>2</sub> O <sub>4</sub>	32588-76-4
		Ethylene-bis(5,6-dibromonorbornane-2,3-dicarboximide)	C <sub>20</sub> H <sub>20</sub> Br <sub>4</sub> N <sub>2</sub> O <sub>4</sub>	52907-07-0
2,3-dibromo-2-butene-1,4-diol	C <sub>4</sub> H <sub>6</sub> Br <sub>2</sub> O <sub>2</sub>	3234-2-4		
Dibromo-neopentyl-glycol	C <sub>5</sub> H <sub>10</sub> Br <sub>2</sub> O <sub>2</sub>	3296-90-0		
Dibromo-propanol	C <sub>3</sub> H <sub>6</sub> Br <sub>2</sub> O	96-13-9		

Classification	Substance Group	Substance	Chemical Formula	CAS No.
Halogenated organic compounds	Brominated flame retardants *2	Tribromo-neopentyl-alcohol	C5H9Br3O	36483-57-5
		Poly tribromo-styrene	—	57137-10-7
		Tribromo-styrene	C8H5Br3	61366-34-1
		Dibromo-styrene grafted PP	—	171091-06-8
		Poly-dibromo-styrene	C8H6Br2	31780-26-4
		Bromo-/Chloro-paraffins	—	68955-41-9
		Bromo-/Chloro-alpha-olefin	—	82600-56-4
		Vinyl bromide	C2H3Br	593-60-2
		Tris-(2,3-dibromo-propyl)-isocyanurate	C12H15Br5N3O3	52434-90-9
		Tris-(2,4-dibromo-phenyl)-phosphate	C18H9Br5O4P	49690-63-3
		Tris (tribromo-neopentyl)-phosphate	C15H24Br9O4P	19186-97-1
		Chlorinated and brominated phosphate ester	—	125997-20-8
		Pentabromo-toluene	C7H3Br5	87-83-2
		Pentabromo-benzyl bromide	C7H2Br6	38521-51-6
		1,3-Butadiene homopolymer, brominated	—	68441-46-3
		Pentabromo-benzyl-acrylate, monomer	C10H5Br5O2	59447-55-1
		Pentabromo-benzyl-acrylate, polymer	(C10H5Br5O2)X	59447-57-3
		Decabromo-diphenyl-ethane	C14H4Br10O2	84852-53-9
		Tribromo-bisphenyl-maleinimide	C10H4Br3NO2	59789-51-4
		Brominated trimethylphenyl-lindane	C18H12Brn	—
		Other brominated flame retardant compounds	—	—
		Vinyl chloride polymer (PVC)	Vinyl chloride polymer (PVC)	(CH2CHCl)n

\*2: Brominated flame retardants except for PBBs and PBDEs. Indicate with ISO code 1043-4 or CAS No.

[Table 5-3] Breakdown List of Substances (Others)

Classification	Substance Group	Substance	Chemical Formula	CAS No.		
Others	Asbestos	Actinolite	Unspecified	77536-66-4		
		Amosite	Unspecified	12172-73-5		
		Anthophyllite	Unspecified	77536-67-5		
		Chrysotile	Unspecified	12001-29-5		
		Crocidolite	Unspecified	12001-28-4		
		Tremolite	Unspecified	77536-68-6		
		Asbestos	Unspecified	1332-21-4		
		Other asbestos	—	—		
	Azo dyes *3	Azo dyes that generate specific amines	—	—		
	Ozone depleting substances *3  (Isomers included)	CFCs (Annex A Group I substances in the Montreal Protocol)  Halons (Annex A Group II substances in the Montreal Protocol)  Other CFCs (Annex B Group I substances in the Montreal Protocol)  Carbon tetrachloride (Annex B Group II substance in the Montreal Protocol)  1,1,1-trichloroethane (Annex B Group III substance in the Montreal Protocol)  Bromochloromethane (Annex C Group III substance in the Montreal Protocol)  Methyl bromide (Annex E substance in the Montreal Protocol)  HBFCs (Annex C Group II substances in the Montreal Protocol)  HCFCs (Annex C Group I substances in the Montreal Protocol)	CFCs (Annex A Group I substances in the Montreal Protocol)	—	—	
			Halons (Annex A Group II substances in the Montreal Protocol)	—	—	
			Other CFCs (Annex B Group I substances in the Montreal Protocol)	—	—	
			Carbon tetrachloride (Annex B Group II substance in the Montreal Protocol)	—	—	
			1,1,1-trichloroethane (Annex B Group III substance in the Montreal Protocol)	—	—	
			Bromochloromethane (Annex C Group III substance in the Montreal Protocol)	—	—	
			Methyl bromide (Annex E substance in the Montreal Protocol)	—	—	
			HBFCs (Annex C Group II substances in the Montreal Protocol)	—	—	
			HCFCs (Annex C Group I substances in the Montreal Protocol)	—	—	
			Radioactive substances	Uranium	U	—
				Plutonium	Pu	—
				Radon	Rn	—
	Americium	Am		—		
	Thorium	Th		—		
	Cesium	Cs		7440-46-2		
	Strontium	Sr		7440-24-6		
	Other radioactive substances	—		—		
	Phthalates	Dibutylphthalate	C18H22O4	84-74-2		
		Di(2-ethylhexyl)phthalate	C24H38O4	117-81-7		
		Diisononyl phthalate	C24H38O4	28553-12-0		
		1,2-benzenedicarboxylic acid diisodecyl ester	C28H46O4	26761-40-0		
		Butyl benzyl phthalate	C19H20O4	85-68-7		
		di-n-octyl phthalate	C6H4(COO(CH2)7CH3)2	117-84-0		
		Diisobutyl phthalate	(C6H4)(COOCH2CH(CH3)2)2	84-69-5		
		Di-n-hexyl phthalate	C20H30O4	84-75-3		
	Trichloroethylene	Trichloroethylene	C2HCl3	1979-1-6		
	Tetrachloroethylene	Tetrachloroethylene	C2Cl4	127-18-4		
	Dichloromethane	Dichloromethane	CH2Cl2	1975-9-2		
	White phosphorus	White phosphorus	P	7723-14-0		
	Benzidine and its salt	Benzidine	C12H12N2	92-87-5		
	4-aminobiphenyl and its salt	4-aminobiphenyl	C12H11N	92-67-1		
	4-nitrobiphenyl and its salt	4-nitrobiphenyl	C12H9NO2	92-93-3		
	Bis(chloromethyl) ether	Bis(chloromethyl)ether	C2H4Cl2O	542-88-1		
	Beta-naphthylamine and its salt	Beta-naphthylamine and its salt	C10H7NH2	91-59-8		
	Benzene	Benzene	C6H6	71-43-2		
	Perchlorate compounds	Lithium perchlorate	LiClO4	7791-3-9		
		Other perchlorate compounds	—	—		
	Tris (2-chloroethyl) phosphate (TCEP)	Tris (2-chloroethyl) phosphate (TCEP)	C6H12Cl3O4P / (ClCH2CH2O)3PO	115-96-8		

Classification	Substance Group	Substance	Chemical Formula	CAS No.
	PFC, SF6,HFC	Carbon tetrafluoride(Perfluoromethane)	CF4	75-73-0
		Perfluoroethane ( Hexafluoroethane)	C2F6	76-16-4
		Perfluoropropane(Octafluoropropane)	C3F8	76-19-7
		Perfluorobutane (Decafluorobutane)	C4F10	355-25-9
		Perfluoropentane(Dodecafluoropentane)	C5F12	678-26-2
		Perfluorohexane(Tetradecafluorohexane)	C6F14	355-42-0
		Perfluorocyclobutane	c-C4F8	115-25-3
		Sulfur Hexafluoride (SF6)	SF6	2551-62-4
		Trifluoromethane - (HFC-23)	CHF3	75-46-7
		Difluoromethane - (HFC-32)	CH2F2	1975-10-5
		Methyl fluoride – (HFC-41)	CH3F	593-53-3
		2H,3H-Decafluoropentane – (HFC-43-10mee)	CF3CHFCHFCF2CF3	138495-42-8
		Pentafluoroethane (HFC-125)	C2HF5	354-33-6
		1,1,2,2-Tetrafluoroethane – (HFC-134)	CHF2CHF2	359-35-3
		1,1,1,2-Tetrafluoroethane – (HFC-134a)	CH2FCF3	811-97-2
		1,1-Difluoroethane – (HFC-152a)	CH3CHF2	75-37-6
		1,1,2-Trifluoroethane–(HFC-143 )	CH2FCHF2	430-66-0
		1,1,1-Trifluoroethane – (HFC-143a)	CH3CF3	420-46-2
		2H-Heptafluoropropane– (HFC-227ea)	CF3CHFCF3	431-89-0
		1,1,1,2,2,3-hexafluoro-propane (HFC-236cb)	CH2FCF2CF3	677-56-5
		1,1,1,2,3,3-Hexafluoropropane –(HFC-236ea)	CHF2CHFCF3	431-63-0
		HFC-1,1,1,3,3,3-Hexafluoropropane – (HFC-236fa)	CF3CH2CF3	690-39-1
		1,1,2,2,3-Pentafluoropropane –(HFC-245ca)	CH2FCF2CHF2	679-86-7
		1,1,1,3,3-Pentafluoropropane –(HFC-245fa)	CHF2CH2CF3	460-73-1
		1,1,1,3,3-Pentafluorobutane – (HFC-365mfc)	CF3CH2CF2CH3	406-58-6
		Formaldehyhde	Formaldehyhde	H2CO
Perfluorooctane sulfonyl fluoride(PFOSF)	Perfluorooctane sulfonyl fluoride(PFOSF)	C8F18O2S	307-35-7	
Pentachlorobenzene	Pentachlorobenzene	C6HCl5	608-93-5	
r-1,c-2,t-3,c-4,t-5,t-6-hexachlorocyclohexane(Alpha hexachlorocyclohexane)	r-1,c-2,t-3,c-4,t-5,t-6-hexachlorocyclohexane(Alpha hexachlorocyclohexane)	C6H6Cl6	319-84-6	
r-1,t-2,c-3,t-4,c-5,t-6-hexachlorocyclohexane (Beta hexachlorocyclohexane)	r-1,t-2,c-3,t-4,c-5,t-6-hexachlorocyclohexane (Beta hexachlorocyclohexane)	C6H6Cl6	319-85-7	
r-1,c-2,t-3,c-4,c-5,t-6-hexachlorocyclohexane (Gamma hexachlorocyclohexane or lindane)	r-1,c-2,t-3,c-4,c-5,t-6-hexachlorocyclohexane (Gamma hexachlorocyclohexane or lindane)	C6H6Cl6	58-89-9	
Decachloropentacyclo [5.3.0 02,6.03,9,04,8] decane-5-one(Chlordecone)	Decachloropentacyclo [5.3.0 02,6.03,9,04,8] decane-5-one(Chlordecone)	C10Cl10O	143-50-0	
2,4-Dinitrotoluene	2,4-Dinitrotoluene	C7H6N2O4	121-14-2	
Anthracene oil	Anthracene oil	–	90640-80-5	
Anthracene oil, anthracene paste, distn. Lights	Anthracene oil, anthracene paste, distn. Lights	–	91995-17-4	
Anthracene oil, anthracene paste, anthracene fraction	Anthracene oil, anthracene paste, anthracene fraction	–	91995-15-2	
Anthracene oil, anthracene-low	Anthracene oil, anthracene-low	–	90640-82-7	
Anthracene oil, anthracene paste	Anthracene oil, anthracene paste	–	90640-81-6	
Aluminosilicate, Refractory Ceramic Fibres	Aluminosilicate, Refractory Ceramic Fibres	–	–	
Zirconia Aluminosilicate, Refractory Ceramic Fibres	Zirconia Aluminosilicate, Refractory Ceramic Fibres	–	–	
Coal tar pitch, high temperature	Coal tar pitch, high temperature	–	65996-93-2	
Acrylamide	Acrylamide	C3H5NO	1979-6-1	
Dimethyl fumarate(DMF)	Dimethyl fumarate(DMF)	C6H8O4	624-49-7	

\*3: The breakdowns of specific amines and ozone depleting substances are shown in Tables 3 and 4 respectively. Although Class II substances are not prohibited, they are included in the scope of investigation.

[Revision History]

Revision	Date	Contents
1	December 10, 1998	Original was issued
2	July 1st, 2004	Completely revised
3	July 1st, 2005	<p>page 1 Explanation "This is the guideline..." was added</p> <p>page 2 Preface partially was revised</p> <p>page 6 "Since neither an alternative..." was added on (4) Controlled Chemical Substances (Rand C)</p> <p>page 13 - 16 [Table 2] list was revised.</p> <ul style="list-style-type: none"> <li>• Changed chemicals (gold, silver, copper, palladium and magnesium deleted)</li> <li>• Threshold value were added (RoHS directive materials)</li> <li>• Applications were corrected based on the latest RoHS directive</li> <li>• Remarks were revised</li> </ul> <p>(Enactment form) Form 1 Some questions are separated for manufacturing company and non-manufacturing company</p> <p>Form 2 Definition of "Not contain" was changed</p> <p>Form 3 Example were added</p>
4	September 19th, 2006	<p>page 2 Preface partially was revised</p> <p>page 13 - 18 [Table 2] list was revised.</p> <ul style="list-style-type: none"> <li>• Applications were corrected based on the latest information of RoHS directive</li> <li>• Materials and the threshold values were added according to the revised Industrial Safety and Health Law.</li> <li>• Remarks were revised</li> </ul>
5	September 1st, 2008	<p>Page 2 Preface partially was revised.</p> <p>Page 5-6 In "Definitions," minerals, substances, preparation and article were added.</p> <p>Page 6 "We will give preferential treatment to partners implementing systems for properly controlling chemical substances contained in materials delivered to our company." added. Based on this, to "Environmental Protection Activity Survey," survey on "Product Environmental Quality Control" added to "Corporate Constitution" which has been surveyed conventionally.</p> <p>Page 7-9 A table of submitted documents were added and brief explanation of submitted documents partly were revised.</p> <p>Page 11-16 Attached table 2 "List of Prohibited/Controlled Chemical Substances" changed.</p> <ul style="list-style-type: none"> <li>• Applications partly were added in accordance with latest information of RoHS directives</li> <li>• Addition of analysis method</li> <li>• Class 1 specified chemical substance of Chemical Substances Control Law were added</li> <li>• Perfluorooctanesulfonic acid (PFOS) and its salts were added.</li> </ul>
5	September 1st, 2008	<p>[Established form] Form 1 1-1 Corporate Constitution and 1-2 Product Environmental Quality Control were established</p> <p>Form 3 3-1 for chemical substances and preparations and 3-2 for article were established</p> <p>Form 4 Review of the title of the form subject to guarantee</p>

Revision	Date	Contents
6	October 1 <sup>st</sup> , 2009	<p>Page 1, 6 Revising the words of "Constitution of Enterprise" to Environmental Management System</p> <p>Page 7-8 JAMP MSDSplus and AIS were added in a table of submitted documents. Brief explanation of submitted documents partly was revised.</p> <p>Page 11-16 - [Table 2] List of Prohibited/Controlled Chemical Substances was changed. - Thresholds of Cd, Pb, Hg in battery were added. - Applications partly were added in accordance with latest information of RoHS directive. - Cobalt dichloride was added. - C rank application of Dichloromethane was added. - 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene) was added - Anthracene was added. - Tris (2-chloroethyl) phosphate was added. - PFC, SF6 and HFC were added. - Formaldehyhde was added. - Perchlorate compounds were added. [Established form] Form 1-1 - The name of form was revised. Form 1-2 - The name of form was revised. Form 2 - The name of form was revised. - Words of certificate were reviewed. - Table of target products was added. Form 3-1 - The name of form was revised. - Inputting items were added - Notes were reviewed. Form 3-2 - The name of form was revised. - Inputting items were added - Notes were reviewed. Form 4 - The name of form was revised. Form 5 - The name of form was revised.</p>
7	2010. 6. 1	<p>Page 11-17 - [Table 2] List of Prohibited/Controlled Chemical Substances was changed. - Applications partly were added in accordance with latest information of RoHS directive - Organotin compounds other than Bis (tri-n-butyltin) oxide (TBTO), Tributyltins (TBTs) and triphenyltins (TPTs) were added.- Diisobutyl phthalate and di-n-hexyl phthalate were added to target applies of phthalates. - C rank application of Dichloromethane was added. - Class I specified chemical substances of Chemical Substances Control Law were added. - SVHCs of REACH regulation were added. - Dimethyl fumarate(DMF) was added. information of RoHS directive. - Organotin compounds other than Bis (tri-n-butyltin) oxide (TBTO), Tributyltins (TBTs) and triphenyltins (TPTs) were added.- Diisobutyl phthalate and di-n-hexyl phthalate were added to target applies of phthalates. - C rank application of Dichloromethane was added. - Class I specified chemical substances of Chemical Substances Control Law were added - SVHCs of REACH regulation were added. - Dimethyl fumarate(DMF) was added.</p>
8	2012. 3. 1	<p>Page 14-23 - [Table 2] List of Prohibited/Controlled Chemical Substances was changed. - Applications were partly added in accordance with the latest information regarding the RoHS - Applications were partly added in accordance with the latest revisions of the European Union. REACH Regulation "Authorized"and "Restricted". - SVHCs of European Union REACH Regulation were added. - Exceptions of Hexachlorobenzene were added. - C rank application of other chlorine compounds was added. Page 20 *2 was revised. *3 was added.</p>

Revision	Date	Contents
8.1	2012. 5. 1	Page 14-23 - [Table 2] List of Prohibited/Controlled Chemical Substances was partially corrected -[Form 3-2] Purpose of containing was revised . -[Appendix 2] Table of intended use code was revised.
8.2	2012. 5. 15	Page 14-23 - [Table 2] List of Prohibited/Controlled Chemical Substances was partially corrected
9.1	2013.10.15	We divided our conventional "Kyocera Green Procurement Guideline" into two and established guidelines "Kyocera Guideline on Environmentally Hazardous Substances" (this Guideline) that specifies the standards for product specifications for promoting green procurement and "Kyocera Guideline on Environmental Protection Activities (for Partners)" that describes the guiding principles for our idea of environmental protection activities. In concurrence with this, the description sentence in the first part was changed (P. 1-5) and Form 1 was transferred to the attached materials for "Kyocera Guideline on Environmental Protection Activities (for Partners)."  <Change/addition to information in Attached Table 2> - No1 cadmium and its compounds Addition of threshold value lower than 100 ppm for cadmium (rank B) contained in photoresistor for analog optocouplers used in industrial audio devices starting on deadline January 1, 2014 - No3 lead and its compounds (1) Instant change in the deadline regarding lead contained in dielectric ceramic in capacitors with rated voltage smaller than 125 VAC or 250 VDC (2) Instant change in the deadline regarding lead contained in connector systems other than C-press compliant pin (3) Dielectric for capacitors used in parts of integrated circuits and discrete devices Addition of threshold value lower than 1000 ppm regarding lead contained in lead zirconate titanate (PZT) based on ceramic starting on deadline July 22, 2016 - No4 mercury and its compounds (1) Fluorescent lamps other than electric bulb type and compact type (small) fluorescent lamps or straight tube fluorescent lamps whose mercury content (per lamp) does not exceed (the following usage quantities): - Straight tube fluorescent halo-phosphate lamps with diameters larger than 28 mm: Instant change in deadline for 10 mg (2) Electric bulb type and compact type (small) fluorescent lamps whose mercury contents per burner do not exceed (the following quantities) (i) Lower than 30 W for general lighting purposes: Changed from 3.5 mg to 2.5 mg (ii) Standard service life using three band fluorescent substance with lamp diameter exceeding 28 mm: Changed from 5 mg to 3.5 mg (iii) Cold cathode fluorescent lamps (CCFLs) and external electrode fluorescent lamps (EEFLs) used for special applications whose mercury content per lamp do not exceed (the following quantity) - Long lamps (exceeding 1500 mm): Changed from 13 mg to 10 mg - No5 tri-substituted organostannic compounds (TBTO, TBTs, TPTs) Clear description of 1000 ppm since the rank B threshold values was not stated - No79 hexabromocyclododecane (HBCDD) Deadline changed from January 1, 2015 to January 1, 2014 - Addition of SVHC substances under European REACH regulation No.107 to No.118 (7th)/No.119 to No.152 (8th)/No.153 to No.156 (9th) - Addition in Remarks of Attached Table 2 in order to clarify the substances specified by IEC62474 (International Electrotechnical Commission) Description "MSDS" in the main text corrected to "SDS"
10	2014.3.1	We append the banned definition for a hazardous materials in P3 4 c Additional of SVHC materials in EU REACH No.157 – 161 (10th additional)
10.1	2014.9.1	Additional of SVHC materials in EU REACH No.162 – 164 (11th additional)
10.2	2015.3.1	Additional of SVHC materials in EU REACH No.165 – 168 (12th additional)
11	2015.9.1	<Change/addition to information in Attached Table 2> •Additional of SVHC materials in EU REACH No.170 – 171 (13th additional) •Adding 「Red phosphorus」 to No.29 •Adding 「Polycyclic aromatic hydrocarbons (PAH)」 to No.80, and adding ※14 to P20 •The deletion of No.63 "Anthracene" in previous version because it is included in the Polycyclic aromatic

Revision	Date	Contents
11	2015.9.1	<ul style="list-style-type: none"> <li>• Changing the year and month of "Note1" in P20 to April 2015</li> <li>• No.1 Cadmium and its compounds <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding Cadmium in colour converting II-VI LEDs (&lt; 10 µg Cd per mm<sup>2</sup> of light-emitting area) for use in solid state illumination or display systems</li> <li>※ Instant change in the deadline regarding Cadmium in photoresist for analog opto-coupler to be used for professional audio equipment.</li> </ul> </li> <li>• No.3 Lead and its compounds <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding Lead in linear incandescent lamps with silicate coated tubes.</li> </ul> </li> <li>• No.4 Mercury and its compounds <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding Mercury in High Pressure Mercury (vapour) lamps (HPMV)</li> </ul> </li> <li>• No.6 Dibutyltin (DBT) compounds <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding More than 1000 ppm (or 0.1 wt%) of the tin contained in materials</li> </ul> </li> <li>• No.11 Arsenic and arsenic compounds <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding B rank use</li> </ul> </li> <li>• No.38 Phthalates <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding B rank use</li> </ul> </li> <li>• No.64 Tris(2-chloroethyl) phosphate <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding B rank use</li> </ul> </li> <li>• No.79 Hexabromocyclododecane (HBCDD) <ul style="list-style-type: none"> <li>※ Instant change in the deadline regarding B rank use</li> </ul> </li> </ul>
11.1	2016.2.1	Additional of SVHC materials in EU REACH No.172 – 176 (14th additional)
11.2	2017.2.15	Additional of SVHC materials in EU REACH No.177 – 181 (15th,16th additional)
12	2018.7.1	<p>Added "chemSHERPA CI", "chemSHERPA AI" and "*" 2" to Table 1 in P7,8  Added "chemSHERPA CI" and "chemSHERPA AI" to [Outline description of submitted documents] in P8</p> <p>&lt;Change/addition to information in Attached Table 2&gt;</p> <ul style="list-style-type: none"> <li>• No.6 Dibutyltin (DBT) compounds <ul style="list-style-type: none"> <li>※ Delete C rank use</li> </ul> </li> <li>• No.7 Dioctyltin (DOT) compounds <ul style="list-style-type: none"> <li>※ Adding C rank use</li> </ul> </li> <li>• No.26 Vinyl chloride polymer (PVC) <ul style="list-style-type: none"> <li>※ Adding B rank use</li> </ul> </li> <li>• No.27 Asbestos <ul style="list-style-type: none"> <li>※ Adding Intentional Use Prohibit</li> </ul> </li> <li>• No.36 Azo dyes that generate certain specific amines <ul style="list-style-type: none"> <li>※ Adding Threshold value : 30ppm</li> </ul> </li> <li>• No.38 Phthalates <ul style="list-style-type: none"> <li>※ Changed the standard based on RoHS Directive in July,2019</li> </ul> </li> <li>• No.43 Perfluorooctane sulfonate (PFOS) and its salts <ul style="list-style-type: none"> <li>※ Add "Stockholm Convention on Persistent Organic Pollutants" in remarks</li> </ul> </li> <li>• No.66 Formaldehyde <ul style="list-style-type: none"> <li>※ Adding B rank use</li> </ul> </li> <li>• No.78 Dimethyl fumarate(DMF) <ul style="list-style-type: none"> <li>※ Adding Threshold value : 0.1ppm</li> </ul> </li> <li>• No.79 Hexabromocyclododecane (HBCDD) <ul style="list-style-type: none"> <li>※ Adding Threshold value : 100ppm</li> </ul> </li> <li>• Additional of SVHC materials in EU REACH No.182 – 190 (17th &amp; 18th additional)</li> <li>• Changed year and month of REACH rule of "Note 1" in P15 to January 2018</li> <li>• Deleted the description of phthalate esters of "*" 8" in P15 and changed subsequent No. to from No.8</li> <li>• Review and change description of general format2, general format3-1, general format3-2</li> </ul>
13	2020.4.15	<p>On P5, add the following as Item 6: [Request concerning control of 4 phthalate esters restricted under RoHS Directives/Reach Regulations]  [Former Item 6] becomes [Item 7] and [former Item 7] becomes [Item 8].</p> <p>&lt;Change/addition to information in Attached Table 2&gt;</p> <ul style="list-style-type: none"> <li>• No.1 Cadmium and cadmium compounds <ul style="list-style-type: none"> <li>※ Reflect content of revisions to usage exemptions in the latest RoHS Directive</li> </ul> </li> <li>• No.3 Lead and its compounds <ul style="list-style-type: none"> <li>※ Reflect content of revisions to usage exemptions in the latest RoHS Directive</li> </ul> </li> <li>• No.4 Mercury and its compounds <ul style="list-style-type: none"> <li>※ Reflect content of revisions to usage exemptions in the latest RoHS Directive</li> </ul> </li> <li>• No.6 Dibutyltin (DBT) compounds <ul style="list-style-type: none"> <li>※ Restrictions on applications for Rank B substances, and addition of Rank C substances</li> </ul> </li> <li>• No.22 Polychlorinated naphthalenes <ul style="list-style-type: none"> <li>※ Amendment to chlorine numbers</li> </ul> </li> </ul>

Revision	Date	Contents
13	2020.4.15	<ul style="list-style-type: none"> <li>•No.26 Vinyl chloride polymer (PVC) <ul style="list-style-type: none"> <li>※amendments to time limits for complete abolition</li> </ul> </li> <li>•No.29 Red phosphorus <ul style="list-style-type: none"> <li>※Restrictions on Rank B substance applications, and amendments to time limits for complete</li> </ul> </li> <li>•No.38 Phthalates <ul style="list-style-type: none"> <li>※Addition of details on REACH Regulation restrictions for Rank B substances</li> </ul> </li> <li>•No.43 Perfluorooctane sulfonate (PFOS) and its salts <ul style="list-style-type: none"> <li>※Additional Rank B substance applications</li> </ul> </li> <li>•No.66 Formaldehyhde <ul style="list-style-type: none"> <li>※Amendments to details of Rank B applications and Rank C applications</li> </ul> </li> <li>•No.156 APFO(Ammonium pentadecafluorooctanoate) <ul style="list-style-type: none"> <li>※Amendments to details of listed substance names</li> </ul> </li> <li>•No.157 PFOA(Pentadecafluorooctanoic acid) <ul style="list-style-type: none"> <li>※Additional Rank B substance applications</li> </ul> </li> <li>•Additional of SVHC materials in EU REACH No.191 – 210 (19th,20th,21st &amp; 22nd additional)</li> <li>•Changed year and month of RoHS Directive and REACH Regulation of "Note 1" in P23</li> </ul>
14	2021.11.1	<ul style="list-style-type: none"> <li>•P3: Change Kyocera's Environmental Charter to Kyocera Group Environmental Safety Policy</li> <li>•P4: Add the following as Item 2(2):「purchases made by Non-production sector」</li> <li>•P5: Cange Material Safety Data Sheet to Safty Date Sheet</li> <li>•P7-8: "JAMP MSDSplus" and "JAMP AIS" deleted from [Table 1:Submitted documents for information on substances of environmental concerns ] and [Explanation of submitted documents]. * 2 has been changed.</li> <li>•P9: Partial rewriting of the information in Item 6 &lt;Change/addition to information in Attached Table 2&gt;</li> <li>•Additional of * 9 Substance No.5, 21, 23, 120, 157, 211, 212</li> <li>•Ranked B for all applications by U.S. TSCA regulations Substance No.56, 214, 215</li> <li>•Ranked C by U.S. TSCA regulations Substance No.213, 216</li> <li>•Additional of * 15 Substance No.213</li> <li>•Ranked C by CEPA(Canadian Environmental Protection Act) * 14 Substance No.189, 231</li> <li>•Change SVHC to Authorization in EU REACH Substance No.95, 160, 162, 164~167, 170, 171, 173,174</li> <li>•Additional of SVHC materials in EU REACH Substance No.217 – 230 (23rd,24th &amp; 25th additional)</li> </ul>

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