

# **Product Environmental Technology Standards**

## **Eleventh Edition**

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Magnescale Co., Ltd.

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## 1 Purposes

This Technology Standards is intended to observe applicable laws, protect the Earth's environment, and reduce harmful effects on the ecosystem through the prevention of the use of environmental management substances in parts, devices, and other products made up of Magnescale products.

In addition, Magnescale Co., Ltd. complies with customer demands of the Green purchasing requirement and others.

## 2 Scope

Applies to our products and OEM products and the following products that make up their packaging.

### 2.1 Scope of application for parts/materials

This applies to parts, materials, and other articles that are adopted for those designed and manufactured by Magnescale and outsourcing of manufacturing.

The targets shall meet reference values specified in this standard.

#### Targeted Parts and Materials

- 1) Half-finished products (assembly parts including functional units, modules, board assemblies and optical fiber assemblies),
- 2) Parts (electric parts, mechanical parts, semiconductor devices, printed circuit boards, recording media, and packaging and raw material), and screws.
- 3) Accessories (AC adapters, cable assemblies and others for using equipment)
- 4) Indirect materials used in products (including materials used in adhesive tape, solder material, tie strap, labels, adhesive agents, etc.)
- 5) Printed matters (including operating manuals, warrantee notes, and supplemental information regarding products and parts)
- 6) Maintenance and repair parts
- 7) Packaging and materials defined in 5.1 "Definition of package parts and materials," used for transportation and protection of parts by the delivery agent.
- 8) Batteries

### 2.2 Scope of application for products

- 1) Magnescale products designed, manufactured, sold, leased or distributed by Magnescale Co., Ltd.
- 2) Magnescale products outsourced to the third parties to design and manufacture, and sold, leased or distributed under the Magnescale brand
- 3) Third parties' products outsourced to Magnescale Co., Ltd to design and manufacture  
However parts/materials designated by a third party are excluded from the scope of application.

**Furthermore, even if not explicitly defined in this standard, in the event that substances and associated applications prohibited and/or restricted by ordinance and regulatory requirements in each country, the ordinance and regulatory requirements shall be observed.**

**Laws and regulations are subject to change, so please refer to the latest version of each regulation for more information.**

### 3 Terms and definitions

#### 3.1 Environment-related substances to be controlled (Controlled Substances)

- 1) Accumulative/persistent/carcinogenic/reproductive toxicity substances that are likely to adversely affect the human body and prohibited and/or restricted by ordinance and regulatory requirements in each country
- 2) Substances that are restricted by customer's green procurement standard, and also the substances that are judged as necessary to be restricted by Magnescale Co., Ltd.

In the event that Magnescale standard is unable to satisfy an external requirement, external requirement shall have priority, and focus on external demands and add substances individually.

- 3) Substances that are contained in materials and/or parts and judged by Magnescale Co., Ltd. to have a significant impact on environment and/or human body

#### 3.2 Management level

Terms used in these management levels are defined as given below.

- 1) Level 1

The substances and their applications classified into this level are those that are banned for the use in parts and materials.

- 2) Level 2

On the date set in each table, the substances and their applications in the respective tables shall be reclassified into Level 1.

- 3) Level 3

Considering possibility of phase-out in the future (i.e. reclassification into Level 2), grasp the status of usage of substances and their uses.

- 4) Exception

Considering items excluded from laws and regulations, also exclude things from the targets of 1) 2) 3).

#### 3.3 Contained

The condition that a substance remains in materials used for part and/or materials by addition, filling, mixture or adhesion, regardless of one's intention.

Even in the case a substance unintentionally got mixed in or adhered to a product in a processing process, we also consider this as "contained".

#### 3.4 Intentional addition

The condition that a substance remains in materials used for parts and/or materials by intentional addition, filling, mixture or adhesion to give a specific characteristic, appearance, property, attribute or quality.

- 1) With respect to the substance which is contained in a natural material and technically not possible to be completely removed by the refining process, also the substance which is generated by the synthesis reaction and technically not possible to be completely removed, those substances are judged as impurities and not considered as "intentional addition".
- 2) With respect to the substances called "impurities" which are distinguished from main material, when they are used for the purpose of changing a characteristic of the material such as alloys, it is considered as "intentional addition".

However, for dopants to produce semiconductor devices, etc., even when extremely small amount is remaining, it is not considered as "intentional addition".

### 3.5 Target

Elements (parts, materials, use, processing) that require to be controlled according to each "management level (described in 3.2)".

### 3.6 Criteria/threshold level

This criteria/threshold level means each "management level (described in 3.2)" or "concentration limit".

- 1) When "concentration limit" is specified in "criteria/ threshold level" of "level 1", and the Controlled Substances is contained as impurities in substance or a part, etc., its density shall not over the "concentration limit".
- 2) When conditions such as "the intentional addition" and "numerical value" are shown in "the criteria/threshold level", it is necessary to satisfy both conditions.

### 3.7 The date of ban the receipt of materials and/or parts.

The date on which Magnescale Co., Ltd. ban the receipt of materials and/or parts.

#### 4 Standard to control environmental management substances

##### 4.1 Environmental management substances

The table below lists the Environmental management substances.

Table 4.1 List of Controlled Substances

No	Controlled Substances	Label
1	Cadmium and cadmium compounds	1
2	Lead and lead compounds	1
3	Mercury and mercury compounds	1
4	Hexavalent chromium compounds	1
5	Polybrominated biphenyls (PBBs)	1
6	Polybrominated diphenyl ethers (PBDEs)	1
7	Bis (2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Diisobutyl phthalate (DIBP)	1,2,3
8	Di-isononyl phthalate (DINP), Di-isodecyl phthalate (DIDP), Di-n-octyl phthalate (DNOP)	1,3
9	Polychlorinated biphenyls (PCBs) and specific substitutes, Polychlorinated naphthalenes (PCNs), Polychlorinated terphenyls (PCTs)	1,2
10	Short-chain chlorinated paraffins (SCCPs)	1
11	Polyvinyl chloride (PVC) and PVC blends	1,3
12	Tris(2-chloroethyl) phosphate (TCEP), Tris(2-chloro-1-methylethyl) phosphate (TCPP), Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)	1,3
13	Hexabromocyclododecane (HBCDD)	1
14	Trisubstituted organotin compounds (including tributyltin (TBT) compounds and triphenyltin (TPT) compounds)	1
15	Dibutyltin (DBT) compounds	1
16	Diocetyl tin (DOT) compounds	1
17	Asbestos	1
18	Azocolourants and azodyes which form certain aromatic amines	1
19	Formaldehyde	1,3
20	Specific benzotriazole	1
21	Dimethyl fumarate (DMF)	1
22	Beryllium oxide	1
23	Cobalt dichloride	1,3
24	Arsenic Compounds (Diarsenic trioxide, Diarsenic pentaoxide, Arsenic acid, etc)	1,2
25	Fluorinated greenhouse gases (PFC, SF6, HFC)	1
26	Ozone depleting substances (ODS)	1
27	Perfluorooctane sulfonates and its salts (PFOS)	1,2
28	Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA	1,2
29	Perfluorooctanoic acid (PFOA) and its salts and related substances	2
30	Polycyclic aromatic hydrocarbons (PAH)	1
31	Hexachlorobenzene (HCB)	2
32	Radioactive materials	1
33	Nickel and Nickel compounds	3
34	Bisphenol A (BPA)	3
35	Beryllium copper and Beryllium compounds	3
36	Chlorinated flame retardants (CFR) and other chlorinated organic compounds	3
37	Brominated flame retardants (BFR) and other brominated organic compounds	3
38	Di-n-pentyl Phthalate (DPENP), Di-n-hexyl Phthalate (DHEXP), Dicyclohexyl Phthalate (DCHP)	3
39	Substances in candidate list for authorization of EU REACH regulation (SVHC)	3

4.2 "Main Targets" of Environmentally Controlled Substances and "Date of Prohibition"

1) Cadmium and cadmium compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Clothing or related accessories, Textiles, footwear	- 1ppm(0.0001wt%) of the cadmium in homogeneous material	Banned
	- All applications other than the above - "See 5 :Additional rules for packaging" components and materials - "See 6 :Additional rules for batteries"	- 100ppm(0.01wt%) of the cadmium in homogeneous material	
CAS No.	Main CAS No.:7440-43-9 (Cadmium), "See 7:for additional materials"		
Exemption	"See 8:for Exemptions"		
Main laws	ANNEX XVII No.72 of REACH Regulation (EC) No 1907/2006, RoHS Directive 2011/65/EU		

2) Lead and lead compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Clothing or related accessories, Textiles, footwear	- 1ppm(0.0001wt%) of the lead in homogeneous material	Banned
	- Paint and similar surface coatings of toys and other articles intended for use by children	- 90ppm(0.009wt%) by weight of lead in surface coating	
	- Consumer products designed or intended primarily for children 12 years of age or younger	- 100ppm(0.01wt%) by weight of lead in the children's product	
	- Wires, cables or cords with thermoset or thermoplastic coatings	- 300ppm(0.03wt%) by weight of lead in surface coating	
	- All applications other than the above - "See 5:Additional rules for packaging" - "See 6:Additional rules for batteries"	- 1000ppm(0.01wt%) of the lead in homogeneous material	
CAS No.	Main CAS No.:7439-92-1(Lead), "See 7:for additional materials"		
Exemption	"See 8:for Exemptions"		
Main laws	ANNEX XVII No.72 of REACH Regulation (EC) No 1907/2006, RoHS Directive 2011/65/EU US/CA Proposition 65 Case law		

3) Mercury and mercury compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
	- "See 5:Additional rules for packaging"	- 1000ppm(0.1wt%) of the mercury in homogeneous material	
	- "See 6:Additional rules for batteries"		
CAS No.	Main CAS No.:7439-97-6(Mercury), "See 7:for additional materials"		
Exemption	"See 8:for Exemptions"		
Main laws	RoHS Directive 2011/65/EU		

4) Hexavalent chromium compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Clothing or related accessories, textiles, footwear	- 1ppm(0.0001wt%) of the hexavalent chromium compounds in homogeneous material	Banned
	- Leather articles or materials	- 3ppm(0.0003wt%) by weight of the total dry weight of the leather	
	- All applications other than the above - "See 5:Additional rules for packaging"	- 1000ppm(0.1wt%) of the hexavalent chromium compounds in homogeneous material	
CAS No.	Main CAS No.:18540-29-9 Hexavalent chromium compounds), "See 7:for additional materials"		
Exemption	"See 8:for Exemptions"		
Main laws	ANNEX XVII No.47 of REACH Regulation (EC) No 1907/2006, ANNEX XVII No.72 of REACH Regulation (EC) No 1907/2006, RoHS Directive 2011/65/EU		

5) Polybrominated biphenyls (PBBs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- 1000ppm(0.1wt%) by weight in homogeneous material	Banned
CAS No.	Main CAS No.:59536-65-1(Polybrominated biphenyls), "See 7:for additional materials"		
Main laws	RoHS Directive 2011/65/EU		

6) Polybrominated diphenyl ethers (PBDEs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) by weight in homogeneous material	Banned
CAS No.	Main CAS No.:1163-19-5(Decabromodiphenyl ether (DecaBDE), "See 7:for additional materials".		
Main laws	RoHS Directive 2011/65/EU		

7) Bis (2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Diisobutyl phthalate (DIBP)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Parts and materials for non-electrical and electronic equipment - Parts and materials that are in a constant contact with human body	- 1000ppm(0.1wt%) by weight in homogeneous material	Banned
Level 2	- Parts and materials for electrical and electronic equipment - All packaging components and materials - Toys or child care article - All applications other than the above	- 1000ppm(0.1wt%) by weight in homogeneous material	February 1, 2020
	- Toys or child care articles	- 1,000ppm(0.1wt%) in total of DEHP, DBP, BBP and DIBP in plasticized materials	February 1, 2020
Level 3	- Parts and materials for non-electrical and electronic equipment - Parts and materials that are in a constant contact with human body - Packing material	- 1,000ppm(0.1wt%) in total of DEHP, DBP, BBP and DIBP in plasticized materials	Undecided
CAS No.	- The target is the following 4 substances 117-81-7 (Bis (2-ethylhexyl) phthalate; Di-2-ethylhexyl phthalate (DEHP)) 84-74-2 (Dibutyl phthalate; Di-n-butyl phthalate (DBP)) 85-68-7 (Butyl benzyl phthalate; N-butyl benzyl phthalate (BBP)) 84-69-5 (Diisobutyl phthalate; Di-i-butyl phthalate (DIBP)) - A threshold level is applied every material		
Main laws	ANNEX XVII No.51 of REACH Regulation (EC) No 1907/2006 2015/863/EU Commission of Commission delegation directive to amend RoHS Directive 2011/65/EU		

8) Di-isononyl phthalate (DINP), Di-isodecyl phthalate (DIDP), Di-n-octyl phthalate (DNOP)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Parts and materials for toys or child care article	- 1,000ppm(0.1wt%) in total of DINP, DIDP and DNOP in plasticized materials	Banned
Level 3	- All applications other than the above	- Intentional addition	Undecided
CAS No.	- Main CAS No.: 28553-12-0, 68515-48-0(Di-isononyl phthalate (DINP)) 26761-40-0, 68515-49-1(Di-isodecyl phthalate (DIDP)) 117-84-0(Di-n-octyl phthalate (DNOP))		
Main laws	ANNEX XVII No.52 of REACH Regulation (EC) No 1907/2006, Directive 2005/84/EC		

9) Polychlorinated biphenyls (PCBs) and specific substitutes, Polychlorinated naphthalenes (PCNs), Polychlorinated terphenyls (PCTs)

9)-1A Polychlorinated biphenyls (PCBs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.:1336-36-3 (Polychlorinated biphenyls (all isomers and homologues))		
Main laws	POPs Regulation (EC) No.850/2004, JAPAN Act on the Evaluation of Chemical Substances and Regulation, US Toxic Substances Control Act (TSCA)		

9)-1B Polychlorinated biphenyls (PCBs) of specific substitutes

Targets		Criteria/Threshold levels	Date of prohibition
Level 2	- All applications	- Intentional addition	February 1, 2020
CAS No.	Main CAS No.: 76253-60-6 (Monomethyl-tetrachlorodiphenyl methane (Ugilec 141)) 81161-70-8 (Monomethyl-dichloro-diphenyl methane (Ugilec 121, Ugilec 21)) 99688-47-8 (Monomethyl-dibromo-diphenyl methane bromobenzylbromotoluene, mixture of isomers (DBBT))		
Main laws	JAPAN Act on the Evaluation of Chemical Substances and Regulation, ANNEX XVII No.24, 25, 26 of REACH Regulation (EC) No 1907/2006		

9)-2 Polychlorinated naphthalenes (PCNs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.:70776-03-3(Polychlorinated naphthalenes)		
Main laws	JAPAN Act on the Evaluation of Chemical Substances and Regulation		

9)-3 Polychlorinated terphenyls (PCTs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- 50ppm(0.005wt%) by weight in material	Banned
CAS No.	Main CAS No.:61788-33-8(Polychlorinated terphenyls)		
Main laws	ANNEX XVII No.1 of REACH Regulation (EC) No 1907/2006		

10) Short-chain chlorinated paraffins (SCCPs)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) by weight in article	Banned
CAS No.	Main CAS No.:85535-84-8(Short-chain chlorinated paraffins), "See 7:for additional materials"		
Main laws	POPs Regulation (EC) No.850/2004		

11) Polyvinyl chloride (PVC) and PVC blends

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Cable ties used for accessories and connecting cords - Packaging components and materials to protect, contain, or transport products or supplied accessories (e.g. bags, adhesive tapes, cartons, and blister packs) - Heat shrink tubes - Flexible flat cables (FFC) - Insulating plates, decorative panels, labels, sheets, and laminates	- Intentional addition	Banned
Level 3	- All applications other than the above	- Intentional addition	Undecided
CAS No.	Main CAS No.:9002-86-2(Polyvinyl chloride)		
Exemption	- Magnetic paints - Binder for resins used for paints, inks, coating agents, adhesives etc. - Dustlip for scale system		
Main laws	US Industry standard JS709 (Definition of "Low-Halogen" For Electronic Products)		

12) Tris(2-chloroethyl) phosphate (TCEP), Tris(2-chloro-1-methylethyl) phosphate (TCPP),  
Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)

12)-1 Tris(2-chloroethyl) phosphate (TCEP), Tris(2-chloro-1-methylethyl) phosphate (TCPP),

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- 1000ppm(0.1wt%) by weight in article	Banned
CAS No.	Main CAS No.: 115-96-8 (Tris(2-chloroethyl) phosphate (TCEP)), 13674-84-5 (Tris(2-chloro-1-methylethyl) phosphate (TCPP))		
Main laws	EU REACH regulation (SVHC), US Vermont State. Act 85		

12)-2 Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All applications	- 1000ppm(0.1wt%) by weight in article	Undecided
CAS No.	Main CAS No.:13674-87-8 (Tris(1,3-dichloro-2-propyl) phosphate (TDCPP))		
Main laws	US Vermont State. Act 85		

13) Hexabromocyclododecane (HBCDD)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 100ppm(0.01wt%) by weight in article	Banned
CAS No.	CAS No. 25637-99-4, 3194-55-6, 134237-50-6, 134237-51-7, 134237-52-8, 4736-49-6, 65701-47-5, 138257-17-7, 138257-18-8, 138257-19-9, 169102-57-2, 678970-15-5, 678970-16-6, 678970-17-7		
Main laws	POPs Regulation (EC) No.850/2004, Commission Regulation (EU)No.293/2016 JAPAN Act on the Evaluation of Chemical Substances and Regulation		

14) Trisubstituted organotin compounds (including tributyltin (TBT) compounds and triphenyltin (TPT) compounds)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) of the tin contained in article	Banned
CAS No.	Main CAS No.:56-35-9(Tributyltinchloride (TBTO)), "See 7:for additional materials"		
Main laws	ANNEX XVII No.20 of REACH Regulation (EC) No 1907/2006 Regulation (EC) No. No.276/2010, JAPAN Act on the Evaluation of Chemical Substances and Regulation		

15) Dibutyltin (DBT) compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) of the tin contained in article	Banned
CAS No.	Main CAS No.:683-18-1(Dibutyltin dichloride), "See 7:for additional materials"		
Main laws	ANNEX XVII No.20 of REACH Regulation (EC) No 1907/2006, Commission RegulationNo.276/2010		

16) Dioctyltin (DOT) compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Textile and leather products intended for contact with the skin - Child care articles - Two-component room temperature vulcanization molding kits (RTV-2 molding kits)	- Intentional addition - 1000ppm(0.1wt%) of the tin contained in article	Banned
CAS No.	Main CAS No.:870-08-6(Dioctyltin oxide), "See 7:for additional materials"		
Main laws	ANNEX XVII No.20 of REACH Regulation (EC) No 1907/2006, Commission RegulationNo.276/2010		

## 17) Asbestos

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.:1332-21-4(Asbestos), "See 7:for additional materials"		
Main laws	ANNEX XVII No.6 of REACH Regulation (EC) No 1907/2006, US Toxic Substances Control Act (TSCA)		

## 18) Azocolourants and azodyes which form certain aromatic amines

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Textiles, fabric materials, leather materials	- 30ppm(0.003wt%) by weight in article	Banned
CAS No.	Main CAS No.:92-87-5(Benzidine), 92-67-1(4-Aminobiphenyl), "See 7:for additional materials"		
Main laws	ANNEX XVII No.43 of REACH Regulation (EC) No 1907/2006		

## 19) Formaldehyde

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- The wooden products, parts and materials made from fiberboard, particleboard, or plywood	- Intentional addition	Banned
	- Textiles, fabric materials	- 75ppm(0.0075wt%) by weight in homogeneous material	
Level 3	- All applications other than the above	- 1000ppm(0.1wt%) by weight in article	Undecided
CAS No.	CAS No.:50-00-0(Formaldehyde)		
Main laws	US California State. CARB Rule, ANNEX XVII No.72 of REACH Regulation (EC) No 1907/2006		

## 20) Specific benzotriazole

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) by weight in article	Banned
CAS No.	CAS No.:3846-71-7(2-benzotriazol-2-yl-4,6-di-tert-butylphenol)		
Main laws	JAPAN Act on the Evaluation of Chemical Substances and Regulation		

## 21) Dimethyl fumarate (DMF)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- 0.1ppm(0.00001wt%) by weight in article	Banned
CAS No.	CAS No.:624-49-7(Dimethylfumarate)		
Main laws	Commission Decision 2009/251/EC		

## 22) Beryllium oxide

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition - 1000ppm(0.1wt%) by weight in article	Banned
CAS No.	CAS No.:1304-56-9(Beryllium oxide)		
Main laws	EU Directive 1999/45/EC		

## 23) Cobalt dichloride

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Moisture indicator used for a desiccant agent (e.g. silica gel)	- Intentional addition	Banned
	- Humidity indicator	- 1000ppm(0.1wt%) by weight in article	
Level 3	- All applications other than the above	- 1000ppm(0.1wt%) by weight in article	Undecided
CAS No.	Main CAS No.:7646-79-9 (Cobalt dichloride), 7791-13-1(Cobalt (II) chloride, hexahydrate),		
Main laws	ANNEX XVII of REACH Regulation (EC) No 1907/2006		

## 24) Arsenic Compounds (Diarsenic trioxide, Diarsenic pentaoxide, Arsenic acid, etc)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Wood	- Intentional addition	Banned
	- Clothing or related accessories textiles footwear	- 1ppm(0.0001wt%) by weight in article	
	- Glass for liquid crystal panels, etc	- Intentional addition - 1000ppm(0.1wt%) by weight in article	
Level 3	- All applications other than the above	- Intentional addition - 1000ppm(0.1wt%) by weight in article	Undecided
CAS No.	Main CAS No.:1327-53-3(Diarsenic trioxide), 1303-28-2(Arsenic pentoxide), 7778-39-4(Arsenic acid), "See 7:for additional materials"		
Main laws	ANNEX XVII No.19, 72 of REACH Regulation (EC) No 1907/2006		

## 25) Fluorinated greenhouse gases (PFC, SF6, HFC)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.:2551-62-4(Sulfur hexafluoride (SF6)), "See 7:for additional materials"		
Main laws	EU regulations No.517/2014		

## 26) Ozone depleting substances (ODS)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.:75-69-4 (CFC-11; Trichlorofluoromethane), "See 7:for additional materials"		
Main laws	Montreal Protocol Annex A, B, C, E EU regulation (EC) No.2037/2000, EU regulation (EC) No. 1005/2009, US Clean Air Act Reference URL: <a href="https://www.environment.gov.au/protection/ozone/montreal-protocol">https://www.environment.gov.au/protection/ozone/montreal-protocol</a> (Montreal Protocol on Substances that Deplete the Ozone Layer) <a href="https://www.meti.go.jp/policy/chemical_management/ozone/law_ozone_outline.html">https://www.meti.go.jp/policy/chemical_management/ozone/law_ozone_outline.html</a> <a href="http://www.env.go.jp/earth/ozone/montreal_protocol.html">http://www.env.go.jp/earth/ozone/montreal_protocol.html</a>		

## 27) Perfluorooctane sulfonates and its salts (PFOS)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Textile	- Intentional addition - 1µg/m <sup>2</sup> in coated material	Banned
	- All applications other than the above	- Intentional addition - 1000ppm(0.1wt%) by weight in material	
CAS No.	Main CAS No.:1763-23-1(Perfluorooctane sulfonic acid (PFOS)), "See 7:for additional materials"		
Main laws	Commission Regulation No.757/2010, Canadian Environmental Protection Act SOR/2008-178 JAPAN Act on the Evaluation of Chemical Substances and Regulation		

## 28) Perfluorooctanoic acid (PFOA) and individual salts and esters of PFOA

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Coatings on textiles, fabric materials and others	- 1µg/m <sup>2</sup> of the coated material (As a total of PFOA)	Banned
	- All applications other than the above	- 1000ppm(0.1wt%) by weight in a part (As a total of PFOA)	
Level 2	- All applications	- Intentional addition - 25ppb(0.000025wt%) by PFOA and its salt in the article	February 1, 2020
CAS No.	Main CAS No.: 335-67-1, 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 376-27-2, 3108-24-5 "See 7:for additional materials"		
Main laws	NORWAY. Product Regulations FOR-2004-06-01-922, ANNEX XVII No.68 of REACH Regulation (EC) No1907/2006		

29) Perfluorooctanoic acid (PFOA) and its salts and related substances

Targets		Criteria/Threshold levels	Date of prohibition
Level 2	- All applications	- Intentional addition - 1000ppb(0.0001wt%) by weight of one or a combination of PFOA-related substances in article	February 1, 2020
CAS No.	Main CAS No.: 335-67-1, 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 376-27-2, 3108-24-5 "See 7:for additional materials"		
Main laws	ANNEX XVII No.68 of REACH Regulation (EC) No 1907/2006		

30) Polycyclic aromatic hydrocarbons (PAH)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Rubber or plastic components for toys and childcare products that repeatedly contacts the skin or oral cavity for a long period of time or in a short period of time	- 0.5ppm(0.00005wt%) by weight in article	Banned
	- Rubber or plastic components except for toys and childcare products that repeatedly contacts the skin or oral cavity for a long period of time or in a short period of time	- 1ppm (0.0001wt%) by weight in article	
CAS No.	Main CAS No.: 50-32-8, 192-97-2, 56-55-3, 218-01-9, 205-99-2, 205-82-3, 207-08-9, 53-70-3 "See 7:for additional materials"		
Main laws	ANNEX XVII No.50 of REACH Regulation (EC) No 1907/2006		

31) Hexachlorobenzene (HCB)

Targets		Criteria/Threshold levels	Date of prohibition
Level 2	- All applications	- Intentional addition	February 1, 2020
CAS No.	Main CAS No.:118-74-1(Hexachlorobenzene (HCB))		
Main laws	POPs Regulation (EC) No.850/2004		

32) Radioactive materials

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All applications	- Intentional addition	Banned
CAS No.	Main CAS No.: 7440-46-2(Cesium137) Cesium (Cs), "See 7:for additional materials"		
Main laws	Council Directive 96/29/Euratom, US Nuclear Regulatory Commission, JAPANese Law on Regulation of Nuclear Materials, Nuclear Fuel Materials and Nuclear Reactors		

33) Nickel and Nickel compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- Parts long-term contact with the skin	- Intentional addition	Undecided
CAS No.	Main CAS No.:7440-02-0(Nickel)		
Main laws	ANNEX XVII No.27 of REACH Regulation (EC) No 1907/2006		

34) Bisphenol A (BPA)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- Thermal paper	- 200ppm(0.02wt%) by weight in article	Undecided
CAS No.	Main CAS No.:80-05-7(Bisphenol A (BPA))		
Main laws	ANNEX XVII No.66 of REACH Regulation (EC) No 1907/2006		

35) Beryllium copper and Beryllium compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All applications	- Intentional addition	Undecided
CAS No.	Main CAS No.:11108-64-8(Beryllium copper) Caution: 1304-56-9(Beryllium oxide) is Level 1 "See 22)"		
Main laws	RoHS PACK15(Candidate substances)		

36) Chlorinated flame retardants (CFR) and other chlorinated organic compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- Flame retardant for laminated printed wiring board	- 900ppm(0.09wt%) total chlorine content by weight in a laminated printed wiring board	Undecided
	- Plastic articles/materials other than the above	- Intentional addition - 1000ppm(0.1wt%) of the chlorine contained in material	
Main laws	US Institute for Printed Circuits IPC-4101, US Industry standard JS709 (Definition of "Low-Halogen" For Electronic Products)		

37) Brominated flame retardants (BFR) and other brominated organic compounds

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- Flame retardant for laminated printed wiring board	- 900ppm(0.09wt%) total bromine content by weight in a laminated printed wiring board	Undecided
	- Plastic articles/materials other than the above	- Intentional addition - 1000ppm(0.1wt%) of the bromine contained in material	
Main laws	US Institute for Printed Circuits IPC-4101, US Industry standard JS709 (Definition of "Low-Halogen" For Electronic Products)		

38) Di-n-pentyl Phthalate (DPENP), Di-n-hexyl Phthalate (DHEXP), Dicyclohexyl Phthalate (DCHP)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- Toys or child care article	- 1000ppm(0.1wt%) by weight in article	Undecided
CAS No.	Main CAS No.:131-18-0(Di-n-pentyl Phthalate (DPENP)), 84-75-3(Di-n-hexyl Phthalate (DHEXP)), 84-61-7(Dicyclohexyl Phthalate (DCHP))		
Main laws	US. Consumer Product Safety Improvement Act 16CFR 1307.3		

39) Substances in candidate list for authorization of EU REACH regulation (SVHC)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- REACH Regulation (SVHC)	- See the URL below	Undecided
CAS No.	EU: CandidateList <a href="https://echa.europa.eu/candidate-list-table">https://echa.europa.eu/candidate-list-table</a>		
Main laws	Article 33 and 7.2 of REACH Regulation (EC) No 1907/2006		

**5 Requirement for packaging components and materials**

**5.1 Definition of "packaging components and materials"**

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

1. However, the definition excludes the components and materials for the returnable containers, which are returned and reused under the control of carriers or parts suppliers, and are not disposed of by end-users or Magnescale Co.,Ltd.
2. If it is disposed of at locations of the Magnescale and is agreed between us and our business partners, packaging will be exempted for the time being.

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

1) Heavy metals (cadmium, lead, mercury, and hexavalent chromium)

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All packaging components and materials	- The sum of heavy metals (Cadmium, Lead, Mercury, Hexavalent chromium) for each component constituting the packaging is 100 ppm (0.01w%)	Banned
CAS No.	Main CAS No.: 7440-43-9(Cadmium), 7439-92-1(Lead), 7439-97-6(Mercury), 18540-29-9(Hexavalent chromium), "See 7:for additional materials"		
Exemption	Cartons for returnable boxes owned by carriers or parts suppliers		
Main laws	EU Directive 94/62/EC on Packaging and Packaging Waste		

2) Polyvinyl chloride (PVC) and PVC blends

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All packaging components and materials	- Intentional addition - Plastic materials in total containing chlorine 1000ppm (0.1wt%)	Undecided
CAS No.	Main CAS No.: 9002-86-2(Polyvinyl chloride)		
Main laws	US Industry standard JS709 (Definition of "Low-Halogen" For Electronic Products)		

3) Bis (2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Diisobutyl phthalate (DIBP)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All packaging components and materials	- 1000ppm (0.1wt%) in total of the concentration of each phthalate in homogeneous material	Undecided
CAS No.	- The target is the following 4 substances 117-81-7 (Bis (2-ethylhexyl) phthalate; Di-2-ethylhexyl phthalate (DEHP)) 84-74-2 (Dibutyl phthalate; Di-n-butyl phthalate (DBP)) 85-68-7 (Butyl benzyl phthalate; N-butyl benzyl phthalate (BBP)) 84-69-5 (Diisobutyl phthalate; Di-i-butyl phthalate (DIBP))		
Main laws	ANNEX XVII No.51 of REACH Regulation (EC) No 1907/2006 2015/863/EU Commission of Commission delegation directive to amend RoHS Directive 2011/65/EU		

4) Halogen compounds and halogen resins (Chlorine and bromine compounds and Chlorine and bromine resins)

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All packaging components and materials	- Intentional addition	Undecided
CAS No.	Main CAS No.: 85535-84-8(Short chain chlorinated paraffins (C10 –13))		
Exemption	Cartons for returnable boxes owned by carriers or parts suppliers		
Main laws	GERMANY Blue Angel, JAPAN Eco Mark		

**6 Additional rules for Batteries**

**6.1 Battery Definition**

"Battery" is a power device that generates DC power using energy

**1) Cadmium and cadmium compounds**

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Manganese battery Alkaline battery Nickel hydride rechargeable battery (Excluding button batteries)	- 10ppm (0.001wt%) of cadmium in battery	Banned
	- Batteries other than the above	- 20ppm (0.002wt%) of cadmium in battery	
CAS No.	Main CAS No.:7440-43-9 (Cadmium), "See 7:for additional materials"		
Main laws	EU Batteries Directive (2006/66/EC)		

**2) Lead and lead compounds**

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- Alkaline batteries (Excluding button batteries)	- 40ppm (0.004wt%) of lead in battery	Banned
	- Manganese battery Alkaline manganese button battery	- 1000ppm (0.1wt%) of lead in battery	
	- Batteries other than the above	- 2000ppm (0.2wt%) of lead in battery	
CAS No.	Main CAS No.:7439-92-1 (Lead), "See 7:for additional materials"		
Main laws	EU Batteries Directive (2006/66/EC)		

**3) Mercury and mercury compounds**

Targets		Criteria/Threshold levels	Date of prohibition
Level 1	- All batteries	- Intentional addition and in battery 1ppm(0.0001wt%) of mercury - Of mercury in homogeneous material 5ppm (0.0005wt%)	Banned
CAS No.	Main CAS No.:7439-97-6 (Mercury) , "See 7:for additional materials"		
Main laws	EU Batteries Directive (2006/66/EC)		

**4) Bis (2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP), Benzyl butyl phthalate (BBP), Diisobutyl phthalate (DIBP)**

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All batteries	- 1000ppm (0.1wt%) in total of the concentration of each phthalate in homogeneous material	Undecided
CAS No.	- The target is the following 4 substances 117-81-7 (Bis (2-ethylhexyl) phthalate; Di-2-ethylhexyl phthalate (DEHP)) 84-74-2 (Dibutyl phthalate; Di-n-butyl phthalate (DBP)) 85-68-7 (Butyl benzyl phthalate; N-butyl benzyl phthalate (BBP)) 84-69-5 (Diisobutyl phthalate; Di-i-butyl phthalate (DIBP))		
Main laws	ANNEX XVII No.51 of REACH Regulation (EC) No 1907/2006 2015/863/EU Commission of Commission delegation directive to amend RoHS Directive 2011/65/EU		

**5) Perchlorate**

Targets		Criteria/Threshold levels	Date of prohibition
Level 3	- All batteries	- For parts 6ppb (0.0000006wt%) containing	Undecided
CAS No.	Main CAS No.: 7791-03-9 (Lithium perchlorate)		
Main laws	US/ California Perchlorate Contamination Prevention Act of 2003		

## 7 List of target CAS numbers

Even if the substance or CAS number is not explicitly specified in this paragraph, the use of which is prohibited or restricted by the laws of each country or region must be followed.

For details, please refer to the latest version of each regulation because the content of the regulation may change.

Table 7.1) Cadmium and cadmium compounds

CAS No.	Name of substance
7440-43-9	Cadmium
7790-78-5	Cadmium chloride, hydrate (2:5)
542-83-6	Cadmium cyanide (Cd(CN) <sub>2</sub> )
2223-93-0	Cadmium stearate
2605-44-9	Cadmium dilaurate
10108-64-2	Cadmium chloride
22750-54-5	Cadmium dichlorate
1306-19-0	Cadmium oxide
7789-42-6	Cadmium bromide
10325-94-7	Cadmium nitrate; cadmium dinitrate
10022-68-1	Cadmium nitrate (Nitric acid cadmium salt tetrahydrate (Cd.2NO <sub>3</sub> .4H <sub>2</sub> O))
543-90-8	Cadmium acetate
21041-95-2	Cadmium hydroxide; cadmium dihydroxide
513-78-0	Cadmium carbonate
12214-12-9	Cadmium selenide sulfide (Cd <sub>2</sub> SeS)
1306-23-6	Cadmium sulphide
10124-36-4	Cadmium sulphate
7790-79-6	Cadmium fluoride
7790-84-3	Cadmium sulfate, hydrate

Table 7.2) Lead and lead compounds

CAS No.	Name of substance
7439-92-1	Lead
7758-97-6	Lead chromate
10099-76-0	Silicic acid (H <sub>2</sub> SiO <sub>3</sub> ), lead (2+) salt (1:1)
20837-86-9	Lead cyanamidate
592-05-2	Lead cyanide
3687-31-8	Trilead diarsenate
7784-40-9	Lead hydrogen arsenate
1344-37-2	Lead sulfochromate yellow; C.I. Pigment Yellow 34; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77603.]
12656-85-8	Lead chromate molybdate sulfate red; C.I. Pigment Red 104; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77605.]
7783-46-2	Lead fluoride
13814-96-5	Lead bis(tetrafluoroborate)
14720-53-7	Lead borate
17570-76-2	Lead (II) methanesulphonate
10101-63-0	Lead iodide
10031-13-7	Lead arsenite

13453-57-1	Lead dichlorite
1072-35-1	Stearic acid, lead (2+) salt
15245-44-0	Lead 2,4,6-trinitroresorcinoxide, lead styphnate
12013-69-3	Plumbate (PbO44-), calcium (1:2), (T-4)-
7758-95-4	Lead chloride
18454-12-1	Lead chromate oxide
56189-09-4	Dibasic lead stearate
57142-78-6	Lead, [1,2-benzenedicarboxylato (2-)] oxodi-
1335-32-6	Lead acetate
1319-46-6	Lead carbonates: Trilead-bis(carbonate)-dihydroxide 2Pb CO3-Pb (OH)2
12202-17-4	Tetralead trioxide sulphate
10294-47-0	Lead dichlorate
13510-96-8	Lead dichlorate monohydrate
13510-89-9	Lead antimonate
1309-60-0	Lead peroxide
1317-36-8	Lead monoxide (lead oxide)
1314-41-6	Orange lead (lead tetroxide)
10099-74-8	Lead dinitrate
301-04-2	Lead di(acetate)
6080-56-4	Lead (II) acetate, trihydrate
19783-14-3	Lead hydroxide
598-63-0	Lead carbonates: Neutral anhydrous carbonate (PbCO3)
1344-40-7	Lead oxide phosphonate, hemihydrate
90583-37-2	Sulfurous acid, lead (2+) salt, basic
7446-27-7	Trilead bis(orthophosphate)
7446-14-2	Lead sulphates: PbSO4
15739-80-7	Lead sulphates: Pbx SO4
12060-00-3	Lead titanium trioxide
1314-87-0	Lead sulfide (PbS)
12036-76-9	Lead oxide sulfate
12065-90-6	Pentalead tetraoxide sulphate
12141-20-7	Trilead dioxide phosphonate
12578-12-0	Dioxobis(stearato)trilead
12626-81-2	Lead titanium zirconium oxide
62229-08-7	Sulfurous acid, lead salt, dibasic
68784-75-8	Silicic acid (H2Si2O5), barium salt (1:1), lead-doped with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD), the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008
69011-06-9	[Phthalato (2-)] dioxotrilead
91031-62-8	Fatty acids, C16-18, lead salts
8012-00-8	Pyrochlore, antimony lead yellow

Table 7.3) Mercury and mercury compounds

CAS No.	Name of substance
7439-97-6	Mercury
592-04-1	Mercuric cyanide
627-44-1	Diethylmercury
593-74-8	Dimethylmercury
592-85-8	Mercuric thiocyanate
54-64-8	Sodium o-(ethylmercurithio)benzoate
15829-53-5	Mercurous oxide
115-09-3	Mercurymethylchloride
7546-30-7	Mercurous chloride
10112-91-1	Mercury chloride
7487-94-7	Mercuric chloride
33631-63-9	Mercury, chloro(cyclohexylmethyl)-
7784-03-4	Mercury disilver tetraiodide
7789-47-1	Mercuric bromide
55-68-5	Phenylmercuric nitrate
10415-75-5	Mercurous nitrate
10045-94-0	Mercuric nitrate
62-38-4	Phenylmercury acetate
631-60-7	Mercurous acetate
1600-27-7	Mercuric acetate
1335-31-5	Mercuric oxycyanide
628-86-4	Mercury-difulminate
1344-48-5	Mercury sulfide (HgS)
21908-53-2	Mercuric oxide
7783-35-9	Mercuric sulfate

Table 7.4) Hexavalent chromium compounds

CAS No.	Name of substance
18540-29-9	Chromium (VI)
7789-00-6	Potassium chromate
13765-19-0	Calcium chromate
7789-06-2	Strontium chromate
7775-11-3	Sodium chromate
13517-17-4	Disodium chromate decahydrate
10294-40-3	Barium chromate
37235-82-8	Dibismuth dichromium nonaoxide
13530-65-9	Chromic acid (H <sub>2</sub> CrO <sub>4</sub> ), zinc salt (1:1)
63020-43-9	Dipotassium zinc bis(chromate)
7758-97-6	Lead chromate
7784-01-2	Silver chromate
11103-86-9	Potassium hydroxyoctaoxidizincatedichromate
1344-37-2	Lead sulfochromate yellow; C.I. Pigment Yellow 34; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77603.]

12656-85-8	Lead chromate molybdate sulfate red; C.I. Pigment Red 104; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77605.]
10060-12-5	Chromic chloride hexahydrate
18454-12-1	Lead chromate oxide
12336-95-7	Chromium sulfate, basic, solid
10025-73-7	Chromium trichloride
16065-83-1	Chromium (III)
1333-82-0	Chromium (VI) trioxide
1308-38-9	Chromium (III) oxide
50922-29-7	Chromium zinc oxide
7789-09-5	Ammonium dichromate
7778-50-9	Potassium dichromate
10588-01-9	Sodium dichromate
13548-38-4	Chromic nitrate
1066-30-4	Chromic acetate
1308-14-1	Chromium (III) hydroxide n-hydrate
13530-68-2	Dichromic acid
7789-12-0	Sodium dichromate
7784-02-3	Silver dichromate
10101-53-8	Chromic sulfate
10141-00-1	Chromium potassium sulfate
49663-84-5	Pentazinc chromate octahydroxide
7789-06-2	Strontium chromate

Table 7.5) Polybromobiphenyls (PBBs)

CAS No.	Name of substance
59536-65-1	Polybromobiphenyls; Polybrominatedbiphenyls (PBB)
13654-09-6	Decabromobiphenyl
59080-36-3	1,1'-Biphenyl, 2,4',5-tribromo-
92-86-4	1,1'-Biphenyl, 4,4'-dibromo-
2052-07-5	2-Bromobiphenyl
2113-57-7	3-Bromobiphenyl
92-66-0	4-Bromobiphenyl
59080-34-1	1,1'-Biphenyl, 2,2',5-tribromo-
40088-45-7	1,1'-Biphenyl, 2,3,3',4'-tetrabromo-
56307-79-0	Pentabromobiphenyl
59080-40-9	1,1'-Biphenyl, 2,2',4,4',5,5'-hexabromo-
36355-01-8	Hexabromobiphenyl
67774-32-7	Firemaster FF-1
35194-78-6	Heptabromobiphenyl
61288-13-9	Bromkal 80
27753-52-2	Nonabromo-1,1'-biphenyl
66115-57-9	1,1'-Biphenyl, 2,2',4,4'-tetrabromo-
60044-24-8	1,1'-Biphenyl, 2,2',4,5'-tetrabromo-
97038-95-4	1,1'-Biphenyl, 2,2',4,6'-tetrabromo-
59080-37-4	1,1'-Biphenyl, 2,2',5,5'-tetrabromo-

60044-25-9	1,1'-Biphenyl, 2,2',5,6'-tetrabromo-
97038-96-5	1,1'-Biphenyl, 2,2',6,6'-tetrabromo-
84303-45-7	1,1'-Biphenyl, 2,3',4,4'-tetrabromo-
59080-38-5	1,1'-Biphenyl, 2,3',4',5-tetrabromo-
77102-82-0	1,1'-Biphenyl, 3,3',4,4'-tetrabromo-
97038-98-7	1,1'-Biphenyl, 3,3',4,5'-tetrabromo-
16400-50-3	1,1'-Biphenyl, 3,3',5,5'-tetrabromo-
59589-92-3	1,1'-Biphenyl, 3,4,4',5-tetrabromo-
59080-35-2	1,1'-Biphenyl, 2,3',5-tribromo-
64258-03-3	1,1'-Biphenyl, 2,4',6-tribromo-
77910-04-4	1,1'-Biphenyl, 2,2',3,4,6-pentabromo-
73141-48-7	1,1'-Biphenyl, 2,2',3,4',5'-pentabromo-
88700-05-4	1,1'-Biphenyl, 2,2',3,5',6-pentabromo-
81397-99-1	1,1'-Biphenyl, 2,2',4,4',5-pentabromo-
97038-97-6	1,1'-Biphenyl, 2,2',4,4',6-pentabromo-
67888-96-4	1,1'-Biphenyl, 2,2',4,5,5'-pentabromo-
80274-92-6	1,1'-Biphenyl, 2,2',4,5,6'-pentabromo-
59080-39-6	1,1'-Biphenyl, 2,2',4,5',6-pentabromo-
97063-75-7	1,1'-Biphenyl, 2,2',4,6,6'-pentabromo-
96551-70-1	1,1'-Biphenyl, 2,3,4,4',5-pentabromo-
38421-62-4	1,1'-Biphenyl, 2,3,4,5,6-pentabromo-
74114-77-5	1,1'-Biphenyl, 2',3,4,4',5-pentabromo-

Table 7.6) Polybromodiphenyl ethers (PBDEs)

CAS No.	Name of substance
101-55-3	Monobromodiphenyl ether
2050-47-7	Dibromodiphenyl ether
49690-94-0	Tribromodiphenyl ether
40088-47-9	Tetrabromodiphenyl ether C <sub>12</sub> H <sub>6</sub> Br <sub>4</sub> O
32534-81-9	Pentabromodiphenyl ether C <sub>12</sub> H <sub>5</sub> Br <sub>5</sub> O
36483-60-0	Hexabromodiphenyl ether C <sub>12</sub> H <sub>4</sub> Br <sub>6</sub> O
68631-49-2	2,2',4,4',5,5'-Hexabromodiphenyl ether
68928-80-3	Heptabromodiphenyl ether C <sub>12</sub> H <sub>3</sub> Br <sub>7</sub> O
207122-16-5	2,2',3,4,4',5',6-Heptabromodiphenyl ether
446255-22-7	2,2',3,3',4,5',6-Heptabromodiphenyl ether
32536-52-0	Diphenylether, octabromo derivative C <sub>12</sub> H <sub>2</sub> Br <sub>8</sub> O
63936-56-1	Nonabromodiphenyl ether
1163-19-5	Bis(pentabromophenyl)ether (decabromodiphenyl ether; decaBDE)

Table 7.7) Bis (2-ethylhexyl) phthalate (DEHP), dibutyl phthalate (DBP), butylbenzyl phthalate (BBP), diisobutyl phthalate (DIBP)

CAS No.	Name of substance
117-81-7	Bis(2-ethylhexyl) phthalate (DEHP); di-(2-ethylhexyl) phthalate
84-74-2	Dibutyl phthalate (DBP)
85-68-7	Benzyl butyl phthalate (BBP)
84-69-5	Diisobutyl phthalate (DIBP)

Table 7.8) Diisononyl phthalate (DINP), diisodecyl phthalate (DIDP), di-n-octyl phthalate (DNOP)

CAS No.	Name of substance
28553-12-0	Di-'isononyl' phthalate (DINP)
68515-48-0	Di-'isononyl' phthalate (DINP)
26761-40-0	Di-'isodecyl' phthalate (DIDP)
68515-49-1	Di-'isodecyl' phthalate (DIDP)
117-84-0	Di-n-octyl phthalate (DNOP)

Table 7.9) -1A, 1B Polychlorinated biphenyls (PCBs) and specified substitutes

CAS No.	Name of substance
1336-36-3	Polychlorinated Biphenyls (PCB)
76253-60-6	Monomethyl-tetrachlorodiphenyl methane Trade name: Ugilec 141
81161-70-8	Monomethyl-dichloro-diphenyl methane Trade name: Ugilec 121 Ugilec 21
99688-47-8	Monomethyl-dibromo-diphenyl methane bromobenzylbromotoluene, mixture of isomers Trade name: DBBT

Table 7.9) -2 Polychlorinated naphthalenes (PCNs)

CAS No.	Name of substance
70776-03-3	Polychlorinated naphthalenes

Table 7.9) -3 Polychlorinated terphenyls (PCTs)

CAS No.	Name of substance
61788-33-8	Polychlorinated terphenyls (PCTs)

Table 7.10) Short-chain chlorinated paraffin (SCCPs)

CAS No.	Name of substance
85535-84-8	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)
61788-76-9	Alkanes, chloro; chloroparaffins
85049-26-9	Alkane, C16-35-, chloro-
108171-26-2	Alkanes, C10-12, chloro
71011-12-6	Alkanes, C12-13, chloro
85535-85-9	Alkanes, C14-17, chloro

Table 7.11) Polyvinyl chloride (PVC) and PVC mixture

CAS No.	Name of substance
9002-86-2	Polyvinyl chloride

Table 7.12) Tris 2-chloroethyl phosphate (TCEP), tris (1-methyl-2-chloroethyl) phosphate (TCPP)

CAS No.	Name of substance
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)
13674-84-5	Tris(2-chloro-1-methylethyl) phosphate (TCPP)

Table 7.13) Hexabromocyclododecane (HBCDD)

CAS No.	Name of substance
25637-99-4	Hexabromocyclododecane
134237-50-6	Alpha-hexabromocyclododecane

134237-51-7	Beta-hexabromocyclododecane
134237-52-8	Gamma-hexabromocyclododecane
678970-15-5	(1R, 2R, 5S, 6R, 9R, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
678970-16-6	(1R, 2S, 5R, 6S, 9S, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
678970-17-7	(1R, 2R, 5R, 6S, 9S, 10R)-1,2,5,6,9,10-Hexabromocyclododecane
138257-18-8	(1R, 2R, 5R, 6S, 9R, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
138257-17-7	(1R, 2R, 5R, 6S, 9S, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
138257-19-9	(1R, 2S, 5S, 6R, 9S, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
169102-57-2	(1R, 2S, 5S, 6S, 9S, 10R)-1,2,5,6,9,10-Hexabromocyclododecane
3194-55-6	1,2,5,6,9,10-Hexabromocyclodecane
4736-49-6	Rel-(1R, 2S, 5R, 6S, 9R, 10S)-1,2,5,6,9,10-Hexabromocyclododecane
65701-47-5	Rel-(1R, 2S, 5R, 6S, 9S, 10R)-1,2,5,6,9,10-Hexabromocyclododecane

Table 7.14) Trisubstituted organotin compounds (including tributyltin (TBT) compounds and triphenyltin compounds (TPT))

CAS No.	Name of substance
1803-12-9	Triphenyltin dimethyldithiocarbamate
379-52-2	Stannane, fluorotriphenyl-
900-95-8	Stannane, acetoxytriphenyl-
639-58-7	Triphenyl tin chloride
76-87-9	Triphenyltin hydroxide
18380-72-8	Triphenyltin fattyacid((9-11)salt)
47672-31-1	Triphenylstannyl decanoate
94850-90-5	Triphenyltin fattyacid((9-11)salt)
7094-94-2	Triphenylstannyl decanoate
2155-70-6	Triphenyltin methacrylate
6454-35-9	Bis(tributylstannyl)Fumarate
1983-10-4	Stannane, tributylfluoro-
31732-71-5	Bis(tributyltin)2,3-dibromosuccinate
56-36-0	Tributyltin acetate
31732-71-5	Bis(tributyltin)2,3-dibromosuccinate
4782-29-0	Bis(tributyltin)phthalate
67772-01-4	Copolymer of alkyl(c=8) acrylate, methyl methacrylate and tributyltin methacrylate
6517-25-5	Tributyltin sulfamate
14275-57-1	Copolymer of alkyl(c=8) acrylate, methyl methacrylate and tributyltin methacrylate
1461-22-9	Tributyltin chloride
7342-38-3	
85409-17-2	Tributyltin naphthenate; Stannane, tributyl-, mono(naphthenoxy) derivs.

Table 7.15) Dibutyltin (DBT) compounds

CAS No.	Name of substance
683-18-1	Dibutyltin dichloride; (DBTC)
7324-74-5	Dibutyltin bis(benzyl maleate)
818-08-6	Dibutyltin oxide
1067-33-0	Dibutyltin diacetate
77-58-7	Dibutyltin dilaurate; dibutyl[bis(dodecanoyloxy)]stannane
78-04-6	Dibutyltin maleate

Table 7.16) Dioctyltin (DOT) compounds

CAS No.	Name of substance
870-08-6	Dioctyltin oxide, (Stannane, dioctyloxo- )
3648-18-8	Dioctyltin dilaurate
26401-97-8	Acetic acid,2,2'-[(dioctylstannylene)bis(thio)]bis-, 1,1'-diisooctyl ester
16091-18-2	Dioctyltin maleate
3542-36-7	Dioctyltin dichloride

Table 7.17) Asbestos

CAS No.	Name of substance
1332-21-4	Asbestos
12001-29-5 132207-32-0	Chrysotile; Asbestos
12001-28-4	Crocidolite; Asbestos
77536-66-4	Actinolite; Asbestos
12172-73-5	Amosite; Asbestos
77536-67-5	Anthophyllite; Asbestos
77536-68-6	Tremolite; Asbestos

Table 7.18) Azo dyes and pigments that produce some aromatic amines

CAS No.	Name of substance
92-67-1	4-Aminobiphenyl; xenylamine; Biphenyl-4-ylamine
92-87-5	Benzidine; 4,4'-diaminobiphenyl; biphenyl-4,4'-ylenediamine
95-69-2	4-Chloro-o-toluidine
91-59-8	2-Naphthylamine; beta-naphthylamine
97-56-3	4-o-Tolylazo-o-toluidine; 4-amino-2',3-dimethylazobenzene; fast garnet GBC base; AAT; o-aminoazotoluene
99-55-8	5-Nitro-o-toluidine
106-47-8	4-Chloraniline
615-05-4	2,4-Diaminoanisole; 4-methoxy-m-phenylenediamine
101-77-9	4,4'-Diaminodiphenylmethane; 4,4'-methylenedianiline
91-94-1	3,3'-Dichlorobenzidine; 3,3'-dichlorobiphenyl-4,4'-ylenediamine
119-90-4	3,3'-Dimethoxybenzidine; o-dianisidine
119-93-7	3,3'-Dimethylbenzidine; o-tolidine; 4,4'-bi-o-toluidine
838-88-0	4,4'-Methylenedi-o-toluidine
120-71-8	6-Methoxy-m-toluidine; p-cresidine
101-14-4	2,2'-Dichloro-4,4'-methylenedianiline; 4,4'-Methylene bis(2-chloroaniline)

101-80-4	4,4'-Oxydianiline; p-Aminophenyl ether
139-65-1	4,4'-Thiodianiline
95-53-4	o-Toluidine; 2-aminotoluene
95-80-7	4-Methyl-m-phenylenediamine; 2,4-Toluenediamine
137-17-7	2,4,5-Trimethylaniline
90-04-0	2-Methoxyaniline; o-anisidine
60-09-3	4-Aminoazobenzene

Table 7.19) Formaldehyde

CAS No.	Name of substance
50-00-0	Formaldehyde

Table 7.20) Specific benzotriazole

CAS No.	Name of substance
3846-71-7	2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)

Table 7.21) Dimethyl fumarate (dimethyl fumarate (DMF))

CAS No.	Name of substance
624-49-7	Dimethylfumarate (DMF)

Table 7.22) Beryllium oxide

CAS No.	Name of substance
1304-56-9	Beryllium oxide

Table 7.23) Cobalt chloride

CAS No.	Name of substance
7646-79-9	Cobalt dichloride
7791-13-1	Cobalt (II) chloride, hexahydrate

Table 7.24) Arsenic compounds (arsenic trioxide, arsenic pentoxide, arsenic acid, etc.)

CAS No.	Name of substance
7778-39-4	Arsenic acid
1303-28-2	Arsenic pentoxide; arsenic oxide
1327-53-3	Diarsenic trioxide; arsenic trioxide
37337-13-6	Chromated copper arsenate
15606-95-8	Triethyl arsenate
3687-31-8	Trilead diarsenate
7778-44-1	Calcium arsenate

Table 7.25) Fluorinated greenhouse gases (PFC, SF6, HFC)

CAS No.	Name of substance
Hydrofluorocarbons (HFCs)	
75-46-7	Trifluoromethane
75-10-5	Difluoromethane
593-53-3	Methyl fluoride
354-33-6	Ethane, pentafluoro-
359-35-3	1,1,2,2-Tetrafluoroethane
811-97-2	1,1,1,2-Tetrafluoroethane
430-66-0	1,1,2-Trifluoroethane
420-46-2	Ethane, 1,1,1-trifluoro-
—	1,2-Difluoroethane (HFC-152)
75-37-6	1,1-Difluoroethane
353-36-6	Ethyl fluoride
431-89-0	Propane, 1,1,1,2,3,3,3-heptafluoro-
677-56-5	1,1,1,2,2,3-Hexafluoro-propane (HFC-236cb)
431-63-0	1,1,1,2,3,3-Hexafluoropropane
690-39-1	Propane, 1,1,1,3,3,3-hexafluoro-
679-86-7	1,1,2,2,3-Pentafluoropropane (HFC-245ca)
460-73-1	1,1,1,3,3-Pentafluoropropane
406-58-6	1,1,1,3,3-Pentafluorobutane
138495-42-8	Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-
Perfluorocarbons (PFCs)	
75-73-0	Tetrafluoro-methane
76-16-4	Hexafluoroethane (PFC-116)
76-19-7	Octafluoropropane (PFC-218)
355-25-9	Decafluorobutane (PFC-31-10)
678-26-2	Dodecafluoropentane (PFC-41-12)
355-42-0	Tetradecafluorohexane (PFC-51-14)
115-25-3	Octafluorocyclobutane (PFC-c318)
Other perfluoro compounds	
2551-62-4	Sulfur hexafluoride

Table 7.26) Ozone depleting substances (ODS)

See "Latest Montreal Protocol Substances."  
 For details on ozone depleting substances, refer to the latest laws and regulations below and "Latest Montreal Protocol Substances" at the following URL:  
 • EU EC No.2037 / 2000 • EC 1005/2009 • U.S. Air Cleansing Act • Applicable to Annex A, B, C, E of Montreal Protocol  
 Reference URL: [http://www.env.go.jp/earth/ozone/montreal\\_protocol.htm](http://www.env.go.jp/earth/ozone/montreal_protocol.htm) (Ministry of the Environment website)  
 Reference URL: <http://ozone.unep.org/> (UNEP Ozone Secretariat website)

Montreal Protocol Annex A Group I (Specified CFCs)

CAS No.	Name of substance	Another Name	Molecular formula
75-69-4	Trichlorofluoromethane	CFC-11	CCl3F
75-71-8	Dichlorodifluoromethane	CFC-12	CCl2F2
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	CFC-113	C2Cl3F3
354-58-5 26523-64-8	Trichlorotrifluoroethane	CFC-113	C2Cl3F3
1320-37-2	Dichlorotetrafluoroethane	CFC-114	C2Cl2F4
76-14-2	Cryofluorane	CFC-114	C2Cl2F4
374-07-2	1,1-Dichloro-1,2,2,2-tetrafluoroethane	CFC-114	C2Cl2F4
76-15-3	Monochloropentafluoroethane	CFC-115	C2ClF5

Montreal Protocol Annex A Group II (Specified Ha Long)

CAS No.	Name of substance	Another Name	Molecular formula
353-59-3	Bromochlorodifluoromethane	Halong-1211	CBrClF2
75-63-8	Bromotrifluoromethane	Halong-1301	CBrF3
25497-30-7	Dibromotetrafluoroethane	Halong-2402	C2Br2F4
124-73-2	Dibromotetrafluoroethane (Halon 2402)	Halong-2402	C2Br2F4
27336-23-8	1,1-Dibromo-1,2,2,2-tetrafluoroethane	Halong-2402	C2Br2F4

Montreal Protocol Annex B Group I (Other CFCs)

CAS No.	Name of substance	Another Name	Molecular formula
75-72-9	Chlorotrifluoromethane	CFC-13	CClF3
354-56-3	Pentachlorofluoroethane	CFC-111	C2Cl5F
28605-74-5	Tetrachlorodifluoroethane	CFC-112	C2Cl4F2
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane	CFC-112	C2Cl4F2
76-12-0	1,2-Difluorotetrachloroethane	CFC-112	C2Cl4F2
-	Heptachlorofluoropropane	CFC-211	C3FCl7
3182-26-1	1,1,1,3,3,3-Hexachloro-2,2-difluoropropane	CFC-212	C3F2Cl6
134237-31-3	Pentachlorotrifluoropropane	CFC-213	C3F3Cl5
29255-31-0	Tetrachlorotetrafluoropropane	CFC-214	C3F4Cl4
1599-41-3	1,2,2-Trichloropentafluoropropane	CFC-215	C3F5Cl3
42560-98-5	Dichlorohexafluoropropane	CFC-216	C3Cl2F6
661-97-2	1,2-Dichloro-1,1,2,3,3,3-hexafluoropropane	CFC-216	C3Cl2F6
-	Chloroheptafluoropropane	CFC-217	C3F7Cl

Montreal Protocol Annex B Group II

CAS No.	Name of substance	Another Name	Molecular formula
56-23-5	Carbon tetrachloride	-	CCl4

## Montreal Protocol Annex B Group III

CAS No.	Name of substance	Another Name	Molecular formula
71-55-6	1,1,1-Trichloroethane (Ethane, 1,1,1-trichloro-)	Methyl chloroform	C2H3Cl3

## Montreal Protocol Annex C Group I (HCFC)

CAS No.	Name of substance	Another Name	Molecular formula
75-43-4	Dichlorofluoromethane	HCFC-21	CHCl2F
75-45-6	Chlorodifluoromethane	HCFC-22	CHClF2
596-70-4	Chlorofluoromethane	HCFC-31	CH2ClF
134237-32-4	1,1,2,2-Tetrachloro-1-fluoroethane	HCFC-121	C2HFCl4
354-11-0	1,1,1,2-Tetrachloro-2-fluoroethane	HCFC-121	C2HFCl4
354-14-3	1,1,2,2-Tetrachloro-1-fluoroethane	HCFC-121	C2HFCl4
354-15-4	Ethane, 1,2-difluoro-1,1,2-trichloro-	HCFC-122	C2HF2Cl3
134237-33-5	Dichlorotrifluoroethane	HCFC-122	C2HF2Cl3
306-83-2	Ethane, 2,2-dichloro-1,1,1-trifluoro-	HCFC-123	C2HCl2F3
34077-87-7	Dichlorotrifluoroethane	HCFC-123	C2HF3Cl2
2837-89-0	Ethane, 2-chloro-1,1,1,2-tetrafluoro-	HCFC-124	C2HClF4
63938-10-3	Chlorotetrafluoroethane	HCFC-124	C2HClF4
134237-34-6	Trichlorofluoroethane	HCFC-131	C2H2FCl3
811-95-0	Ethane, 1,1,2-trichloro-1-fluoro-	HCFC-131	C2H2FCl3
27154-33-2	Trichlorofluoroethane	HCFC-131	C2H2FCl3
25915-78-0	Dichlorodifluoroethane	HCFC-132	C2H2F2Cl2
1330-45-6	Chlorotrifluoroethane	HCFC-133	C2H2ClF3
75-88-7	Chloro-1,1,1-trifluoroethane	HCFC-133	C2H2ClF3
421-04-5	1-Chloro-1,1,2-trifluoroethane	HCFC-133	C2H2ClF3
431-07-2	1-Chloro-1,2,2-trifluoroethane	HCFC-133	C2H2ClF3
1717-00-6	Ethane, 1,1-dichloro-1-fluoro-	HCFC-141b	C2H3Cl2F
25167-88-8	Dichlorofluoroethane	HCFC-141	C2H3FCl2
430-57-9	1,2-Dichloro-1-fluoroethane	HCFC-141	C2H3FCl2
75-68-3	1-Chloro-1,1-difluoroethane	HCFC-142b	C2H3ClF2
25497-29-4	Chlorodifluoroethanes	HCFC-142	C2H3F2Cl
338-64-7	Ethane, 1-chloro-1,2-difluoro-	HCFC-142	C2H3F2Cl
110587-14-9	Chlorofluoroethane	HCFC-151	C2H4FCl
762-50-5	1-Chloro-2-fluoroethane (HCFC-151)	HCFC-151	C2H4FCl
1615-75-4	1-Chloro-1-fluoroethane (HCFC-151a)	HCFC-151	C2H4FCl
134237-35-7	Hexachlorofluoropropane	HCFC-221	C3HFCl6
134237-36-8	Pentachlorodifluoropropane	HCFC-222	C3HF2Cl5
134237-37-9	Tetrachlorotrifluoropropane	HCFC-223	C3HF3Cl4
134237-38-0	Trichlorotetrafluoropropane	HCFC-224	C3HF4Cl3
127564-91-4	Trichlorotetrafluoropropane	HCFC-224	C3HF4Cl3
422-56-0	1,1-Dichloro-2,2,3,3,3-pentafluoropropane	HCFC-225ca	C3HCl2F5
507-55-1	1,3-Dichloro-1,1,2,2,3-pentafluoropropane	HCFC-225cb	C3HCl2F5
422-44-6	1,2-Dichloro-1,1,2,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
422-48-0	2,3-Dichloro-1,1,1,2,3-pentafluoropropane	HCFC-225	C3HCl2F5
431-86-7	1,2-Dichloro-1,1,3,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
13474-88-9	1,1-Dichloro-1,2,2,3,3-pentafluoropropane	HCFC-225	C3HCl2F5

111512-56-2	1,1-Dichloro-1,2,3,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
127564-92-5	1,2-Dichloro-1,1,3,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
128903-21-9	2,2-Dichloro-1,1,1,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
136013-79-1	1,3-Dichloro-1,1,2,3,3-pentafluoropropane	HCFC-225	C3HCl2F5
134308-72-8	Chlorohexafluoropropane (HCFC-226)	HCFC-226	C3HF6Cl
422-55-9	1-Chloro-1,1,2,2,3,3-hexafluoropropane	HCFC-226	C3HF6Cl
422-57-1	3-Chloro-1,1,1,2,2,3-hexafluoropropane	HCFC-226	C3HF6Cl
134190-48-0	Pentachlorofluoropropane	HCFC-231	C3H2FCl5
134237-39-1	Tetrachlorodifluoropropane	HCFC-232	C3H2F2Cl4
127564-82-3	Tetrachlorodifluoropropane	HCFC-232	C3H2F2Cl4
134237-40-4	Trichlorotrifluoropropane	HCFC-233	C3H2F3Cl3
127564-83-4	Dichlorotetrafluoropropane	HCFC-234	C3H2F4Cl2
134237-41-5	Chloropentafluoropropane	HCFC-235	C3H2F5Cl
134190-49-1	Tetrachlorofluoropropane	HCFC-241	C3H3FCl4
134237-42-6	Trichlorodifluoropropane	HCFC-242	C3H3F2Cl3
127564-90-3	Trichlorodifluoropropane	HCFC-242	C3H3F2Cl3
134237-43-7	Dichlorotrifluoropropane	HCFC-243	C3H3F3Cl2
134190-50-4	Chlorotetrafluoropropane	HCFC-244	C3H3F4Cl
134190-51-5	Trichlorofluoropropane	HCFC-251	C3H4FCl3
818-99-5	1,1,3-Trichloro-1-fluoropropane	HCFC-251	C3H4FCl3
134190-52-6	Dichlorodifluoropropane	HCFC-252	C3H4F2Cl2
134237-44-8	Chlorotrifluoropropane	HCFC-253	C3H4F3Cl
134237-45-9	Dichlorofluoropropane	HCFC-261	C3H5FCl2
7799-56-6	1,1-Dichloro-1-fluoropropane	HCFC-261	C3H5FCl2
134190-53-7	Chlorodifluoropropane	HCFC-262	C3H5F2Cl
102738-79-4	2-Chloro-1,3-difluoropropane	HCFC-262	C3H5F2Cl
134190-54-8	Chlorofluoropropane	HCFC-271	C3H6FCl

## Montreal Protocol Annex C Group II (HBFC)

CAS No.	Name of substance	Another Name	Molecular formula
1863-53-7	Dibromofluoromethane	-	CHFBr2
1511-62-2	Bromodifluoromethane	HBFC-22b1	CHBrF2
373-52-4	Bromofluoromethane	-	CH2FBr
-	Tetrabromofluoroethane	-	C2HFBr4
-	Tribromodifluoroethane	-	C2HF2Br3
-	Dibromotrifluoroethane	-	C2HF3Br2
124-72-1	Bromotetrafluoroethane (HBFC-124 B1)	-	C2HF4Br
-	Tribromofluoroethane	-	C2H2FBr3
-	Dibromodifluoroethane	-	C2H2F2Br2
421-06-7	2-Bromo-1,1,1-trifluoroethane	-	C2H2BrF3
358-97-4	1,2-Dibromo-1-fluoroethane	-	C2H3Br2F
359-07-9	C2H3F2Br: Bromo-1,1-difluoroethane (Ethane, 2-bromo-1,1-difluoro- )	-	C2H3BrF2
762-49-2	1-Bromo-2-fluoroethane	-	C2H4BrF
-	Hexabromofluoropropane	-	C3HFBr6
-	Pentabromodifluoropropane	-	C3HF2Br5

-	Tetrabromotrifluoropropane	-	C3HF3Br4
-	Tribromotetrafluoropropane	-	C3HF4Br3
-	Dibromopentafluoropropane	-	C3HF5Br2
2252-78-0	1-Bromo-1,1,2,3,3,3-hexafluoropropane	-	C3HF6Br
-	Pentabromofluoropropane	-	C3H2FBr5
-	Tetrabromodifluoropropane	-	C3H2F2Br4
-	Tribromotrifluoropropane	-	C3H2F3Br3
-	Dibromotetrafluoropropane	-	C3H2F4Br2
-	Bromopentafluoropropane	-	C3H2F5Br
-	Tetrabromofluoropropane	-	C3H3FBr4
-	Tribromodifluoropropane	-	C3H3F2Br3
-	Dibromotrifluoropropane	-	C3H3F3Br2
-	Bromotetrafluoropropane	-	C3H3F4Br
-	Tribromofluoropropane	-	C3H4FBr3
-	Dibromodifluoropropane	-	C3H4F2Br2
-	Bromotrifluoropropane	-	C3H4F3Br
-	Dibromofluoropropane	-	C3H5FBr2
-	Bromodifluoropropane	-	C3H5F2Br
-	Bromofluoropropane	-	C3H6FBr

## Montreal Protocol Annex C Group III

CAS No.	Name of substance	Another Name	Molecular formula
74-97-5	Chlorobromomethane	-	CH2BrCl

## Montreal Protocol Annex E Group I

CAS No.	Name of substance	Another Name	Molecular formula
74-83-9	Methyl bromide (Bromomethane)	-	CH3Br

Table 7.27) Perfluorooctanesulfonic acid (including salt) (PFOS)

CAS No.	Name of substance
1763-23-1	Perfluorooctane sulfonic acid; Heptadecafluorooctane-1-sulfonic acid
251099-16-8	Decanaminium, N-decyl-N,N-dimethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulphonic acid (1:1)
2795-39-3	Potassium perfluorooctanesulfonate; Potassium heptadecafluorooctane-1-sulfonate
29081-56-9	Ammonium perfluorooctane sulfonate; Ammonium heptadecafluorooctanesulfonate
29457-72-5	Lithium perfluorooctane sulfonate; Lithium heptadecafluorooctanesulfonate
307-35-7	1-Octanesulphonyl fluoride, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
335-95-5	Sodium salt of PFOA
4021-47-0	Sodium perfluoro(octane-1-sulfonate)
5324-84-5	Sodium 1-octanesulfonate
70225-14-8	Diethanolamine perfluorooctane sulfonate
376-14-7	2-Propenoic acid, 2-methyl-, 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester
1691-99-2	Octanesulphonamide,N-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-(2-hydroxyethyl)-
24448-09-7	Octanesulphonamide,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-(2-hydroxyethyl)-N-methyl-

4151-50-2	1-Octanesulphonamide, N-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
31506-32-8	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-N-methyl-

Table 7.28) 29) Perfluooctanoic acid (PFOA) and individual salts, esters of PFOA and PFOA-related substances

CAS No.	Name of substance
335-67-1	Perfluorooctanoic acid (PFOA)
3825-26-1	Ammoniumpentadecafluorooctanoate
335-95-5	Sodium salt of PFOA
2395-00-8	Potassium salt of PFOA
335-93-3	Silver salt of PFOA
335-66-0	Pentadecafluorooctyl fluoride
376-27-2	Methylperfluorooctanoate
3108-24-5	Ethylperfluorooctanoate
101947-16-4	Perfluorooctylethyltriethoxysilane
148240-85-1	1,3-Propanediol, 2,2-bis(.gamma.-.omega.-perfluoro-C4-10-alkyl)thiomethyl derivs., phosphates, ammonium salts
148240-87-3	1,3-Propanediol, 2,2-bis(.gamma.-.omega.-perfluoro-C6-12-alkyl)thiomethyl derivs., phosphates, ammonium salts
160336-09-4	2-Propenoic acid, C16-18-alkyl esters, polymers with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl acrylate
1996-88-9	8:2 Fluorotelomer methacrylate, 2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester
2043-53-0	2-(perfluorooctyl)ethyl iodide, 8-2 telomer iodide;; Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-iodo-
206886-57-9	Cyclotetrasiloxane, 2-(4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoroundecyl)-2,4,6,8-tetramethyl-, Si-[3-(oxiranylmethoxy)propyl] derivs
21652-58-4	8-2 Telomer olefin;; 8:2 Fluorotelomer olefin
24216-05-5	3,4-Bis[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctyl)amino]benzenesulphonyl chloride;3,4-Bis(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctylamino)benzenesulfonyl chloride
27854-31-5	Decanoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-
27905-45-9	8:2 Fluorotelomer acrylate, 2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester
3102-79-2	Polyfluorinated silanes; Perfluorodecylchloromethylsilane; C8-PFSi
325459-92-5	Tris[4-(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)phenyl]phosphine
326475-46-1	Bis[tris(4-(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)phenyl)phosphine]palladium(ii) dichloride
33496-48-9	Pentadecafluorooctanoic anhydride
39186-68-0	2-Carboxyethylbis(2-hydroxyethyl)-3-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctyl)amino]propylammonium hydroxide
40143-78-0	Per- and polyfluorinated phosphonic acids; Perfluorooctyl phosphonic acid; C8-PFPA
40143-79-1	Bis(perfluorooctyl) phosphinic acid; C8/C8-PFPIA
41358-63-8	N-[3-[bis(2-hydroxyethyl)amino]propyl]-2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanamide
507-63-1	C8 iodide: (Octane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-8-iodo- ); Perfluorooctyl iodide

53515-73-4	2-Propenoic acid, 2-methyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl ester, polymer with 2-propenoic acid
53517-98-9	1-Propanaminium,N,N,N-trimethyl-3-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctyl)amino]-, chloride
57678-03-2	8:2 Fluorotelomer phosphate monoester; 8:2 monoPAP
610800-34-5	Bis(perfluorooctyl) phosphinic acid; C6/C8-PFPIA
65530-57-6	Poly(difluoromethylene), alpha-fluoro-omega-[2- [[2-(trimethylammonio)ethyl]thio]ethyl]-, methyl sulfate
65530-61-2	Poly(difluoromethylene), .alpha.-fluoro-.omega.-2-(phosphonoxy)ethyl-
65530-62-3	Poly(difluoromethylene), .alpha.,.alpha.-phosphinicobis(oxy-2,1-ethanediyl)bis.omega.-fluoro-
678-39-7	8-2 Telomer alcohol.; 1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-
678-41-1	Polyfluoroalkyl phosphoric acid diesters; 8:2 Fluorotelomer phosphate diester; 8:2 diPAP
68141-02-6	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) salt (3:1)
68333-92-6	Fatty acids, C7-13, perfluoro
69278-80-4	Fatty acids, C7-13, perfluoro, compds. with ethylamine
70887-84-2	2-Decenoic acid, 3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-hexadecafluoro-
71608-61-2	Pentanoic acid, 4,4-bis(.gamma.-.omega.-perfluoro-C8-20-alkyl)thio derivs., compds. With diethanolamine;4,4-Bis[(gamma-omega-perfluoro-alkyl(C=8-20))thio]pentanoic acid derivs. compds. with diethanolamine
72623-77-9	Fatty acids, C6-18, perfluoro, ammonium salts
72968-38-8	Carboxylic acids, C7-13, perfluoro, ammonium salts
74612-30-9	Perfluorodecyldimethylchlorosilane
78560-44-8	Silane, trichloro(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-
80010-37-3	Poly(difluoromethylene), .alpha.-fluoro-.omega.-(2-sulfoethyl)-
83048-65-1	Silane, (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)trimethoxy-
84029-60-7	Heptadecafluoro-1-[(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctyl)oxy]nonene
85938-56-3	N-(3-aminopropyl)-2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanamide;Einecs 288-891-4
89685-61-0	Propanesulfonic acid, 3-[ethyl(2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctyl)amino] -, sodium salt
90480-57-2	Octanoic acid, pentadecafluoro-, mixed esters with 2,2'-[1,4-butanediylbis(oxymethylene)]bis[oxirane] and 2,2'-[1,6-hexanediylbis(oxymethylene)]bis[oxirane]
90622-99-4	Amides, C7-19, alpha-omega-perfluoro-N,N-bis(hydroxyethyl)
91032-01-8	Fatty acids, C7-19, perfluoro
93480-00-3	Poly(oxy-1,2-ethanediyl),a-[2-[2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-1-oxooctyl)amino]ethyl]-w-hydroxy
93857-44-4	8:2 Fluorotelomer phosphate monoester ammonium salt
94200-45-0	Diammonium 4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoro-2-hydroxyundecyl phosphate
95370-51-7	Carbamic acid, [2-(sulfothio)ethyl]-, C-(gamma-omega-perfluoro-C6-9-alkyl) esters, monosodium salts
98241-25-9	Ethanaminium, N,N,N-triethyl-,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)

Table 7.30) Polycyclic aromatic hydrocarbons (PAH)

CAS No.	Name of substance
83-32-9	Acenaphthene
120-12-7	Anthracene
193-39-5	Indeno [1,2,3-cd] pyrene
218-01-9	Chrysen (CHR)
53-70-3	Dibenzo[a,h]anthracene (DBAhA)
132-65-0	Dibenzothiophene
192-65-4	Dibenzo [a, e] pyrene
189-64-0	Dibenzo [a, h] pyrene
189-55-9	Dibenzo [a, i] pyrene
191-30-0	Dibenzo [a, l] pyrene
91-20-3	Naphthalene
129-00-0	Pyrene
85-01-8	Phenanthrene
206-44-0	Fluoranthene
86-73-7	9H-fluorene
56-55-3	Benzo [a] anthracene (BaA)
50-32-8	Benzo [a] pyrene (BaP); benzo [d, e, f] chrysene
192-97-2	Benzo [e] pyrene (BeP)
195-19-7	Benzo [c] phenanthrene
205-99-2	Benzo[b]fluoranthene (BbFA); benzo[e]acephenanthrylene
205-82-3	Benzo[j]fluoranthene (BjFA)
207-08-9	Benzo[k]fluoranthene (BkFA)
191-24-2	Benzo[ghi]perylene
3697-24-3	5-Methylchrysene

Table 7.31) Hexachlorobenzene (HCB)

CAS No.	Name of substance
118-74-1	Hexachlorobenzene

Table 7.32) Radioactive materials

CAS No.	Name of substance
7440-61-1	Uranium
10043-92-2	Radon
14596-10-2	Americium-241
7440-29-1	Thorium
7440-46-2	Cesium
10045-97-3	Cesium-137
7440-24-6	Strontium
10098-97-2	Strontium-90
7440-07-5	Plutonium
7440-14-4	Radium

**8 Exemption**

The European RoHS Directive and the exemption from the application of each law inclusive effective timing shall be identical for this RMS-0002.

**9 Revisions**

Edition	Released date	Remarks
1	18 January, 2010	JAPANEse edition 1
2	15 March, 2010	JAPANEse edition 2
3	1 August, 2010	Janapese / English edition 3
4	1 June, 2012	Janapese / English edition 4
5	13 January, 2014	English edition 5
6	27 February, 2015	English edition 6
7	24 March, 2015	English edition 7
8	12 September, 2017	English edition 8
9	28 February, 2018	English edition 9
10	11 December, 2018	English edition 10
10.1	18 December, 2019	English edition 10.1
11	31 January, 2020	English edition 11 < Latest edition >