

**Annex to the Citizen Group Green**

**Procurement Guidelines**

**List of Controlled Substances**

**Ver. 14.2**

Rank 1: Standards for substances whose use in materials is prohibited

Rank 2: Standards for substances whose use is restricted by conditions such as thresholds and content parts

Rank 3: Standards for substances for which accurate information must be provided, as well as the identification and management of content and content parts

Rank 4: Standards for substances that are prohibited from use in the manufacturing process of procured items

**Issued on July 1, 2023**

**Citizen Watch Co.,Ltd.**

**Rank 1 : Standards for substances whose use in materials is prohibited**

Relevant legislation: Class 1 Specific Chemical Substances prescribed in the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. (hereafter, the “Chemical Substances Control Law”), Article 2, Paragraph 2, Substances Prohibited for Manufacture by the Industrial Safety and Health Act, Article 55, Specified Substances prescribed in the Law Concerning the Protection of the Ozone Layer Through the Control of Specified Substances and other Measures (hereinafter referred to as the Ozone Layer Protection Law), Article 2, Paragraph 1, 5 types of PBT substances according to the U.S. Toxic Substances Control Act (TSCA), Article 6(h), and Substances prohibited under paragraph 2 of Supplementary Provision 16 (PFAS) of the Swiss Chemicals Risk Reduction Decree.

Meanwhile, Class 1 Specific Chemical Substances, which are byproducts of the manufacture of other chemical substances, should be managed in accordance with the principles of best available technology (BAT) and in compliance with the standards set by government agencies.

No.	Chemical substances	CAS No.	Primary legislation	Primary environmental effects	Primary applications
1	Aldrin	309-00-2	Chemical Substances Control Law	Persistency, high accumulability	Insecticides
2	Endrin	72-20-8	As above	As above	Insecticides
3	Chlordanes		As above	As above	Termite disinfectants etc.
4	Dieldrin	60-57-1	As above	As above	Insecticides
5	Hexachlorobenzene	118-74-1	As above	As above	Raw material for insecticides etc
6	DDT	50-29-3	As above	As above	Insecticides
7	N,N'-Ditolyl-p-phenylenediamine		As above	As above	Antioxidants for rubber, styrene-butadiene rubber
8	2,4,6-Tri-tert-butylphenol	732-26-3	As above TSCA	As above	Antioxidants and other additives (limited to lubricating oils and fuel oils) , lubricating oil
9	Toxaphene	8001-35-2	As above	As above	Insecticides, mite control agents (in agricultural and livestock farming applications)
10	Mirex	2385-85-5	As above	As above	Flame retardants for resins, paints, paper, electrical products etc., insecticide, ant repellent
11	Bis(tributyltin) oxide	56-35-9	As above	As above	Antifouling agent for fishing nets, and boat hulls etc.
12	Polychlorinated biphenyls (PCB)		As above	As above	Insulating oils etc.
13	Polychloronaphthalenes (with 2 or more chlorine atoms)		As above	As above	Machine oils etc.

No.	Chemical substances	CAS No.	Primary legislation	Primary environmental effects	Primary applications
14	Dicohol		As above	As above	Mite preventative agents
15	Hexachlorobuta-1,3-diene	87-68-3	As above TSCA	As above	Solvents
16	2-(2H-1,2,3-Benzotriazole-2-yl)-4,6-di-tert-butylphenol	3846-71-7	As above	As above	UV light absorbents
17	Perfluoro (octane-1-sulfonic acid)(PFOS) or its salts		As above	As above	Water and oil repellents, surfactants
18	Perfluoro (octane-1-sulfonyl) = fluoride (PFOSF)	307-35-7	As above	As above	PFOS raw material
19	Pentachlorobenzene	608-93-5	As above	As above	Agricultural chemicals, by-products
20	alpha-Hexachlorocyclohexane	319-84-6	As above	As above	Lindane by-product
21	beta-Hexachlorocyclohexane	319-85-7	As above	As above	Lindane by-product
22	gamma-Hexachlorocyclohexane (also known as Lindane)	58-89-9	As above	As above	Agricultural chemicals, insecticides
23	Chlordecone	143-50-0	As above	As above	As above
24	Hexabromobiphenyl	36355-01-8	As above	As above	Flame retardants
25	Tetrabromodiphenyl ether		As above	As above	As above
26	Pentabromodiphenyl ether		As above	As above	As above
27	Hexabromodiphenyl ether		As above	As above	As above
28	Heptabromodiphenyl ether		As above	As above	As above
29	Endosulfan	115-29-7	As above	As above	Agricultural chemicals
30	Hexabromocyclododecane (HBCD)	3194-55-6	As above	As above	Flame retardant treatment for textiles, flame retardant beads for EPS, flame-proofed textiles and curtains
31	Pentachlorophenol and its salts and esters		As above	As above	Wood antiseptics, Insecticides and fungicides
32	Polychlorinated linear paraffin(having 10 to 13 carbon atoms and containing more than 48% of chlorine by total weight)		As above	As above	Flame retardants
33	Decabromodiphenyl ether		As above TSCA	As above	As above
34	Perfluorooctanoic acid (PFOA) and its salts, PFOA-related substances		As above	As above	For semiconductor, extinguishing agents, water repellents
35	Asbestos		(*2)	Carcinogenic	Insulator, filler, thermal insulation
36	Bis(chloromethyl) ether	542-88-1	As above	As above	Dyes, Pigments
37	4-Aminodiphenyl	92-67-1	As above	As above	Pigments
38	4-Nitrodiphenyl and its salts		As above	As above	Dye intermediate
39	Benzidine and its salts	92-87-5	As above	As above	Dyes, Hardener
40	beta-Naphthylamine and its	91-59-8	As above	As above	Dyes, Antioxidant

No.	Chemical substances	CAS No.	Primary legislation	Primary environmental effects	Primary applications
	salts				intermediate
41	Yellow phosphorous		As above	Flammability, acute toxicity	Matches
42	Benzene adhesive (greater than 5% benzene)		As above	Carcinogenic	Rubber adhesive
43	Ozone depleting substances (*3)		Ozone Layer Protection Law	Ozone layer destruction	Refrigerants, foaming agents, extinguishing agents
44	Pentachlorobenzenethiol (PCTP)	133-49-3	TSCA	Non-decomposable and highly accumulative	Additive for improving rigidity of rubber products
45	Tris(isopropylphenyl) phosphate PIP (3:1)	68937-41-7	TSCA	Non-decomposable and highly accumulative	Flame retardant plasticizers for vinyl chloride products
46	Perfluorohexanesulfonic acid (PFHxS), its chlorides and related substances		Chemicals Risk Reduction Decree	Persistent and highly accumulative	Extinguishing foam, abrasives and cleaners, coatings, etc.

(\*1) The term "ozone-depleting substances" refers to the Specified Substances listed in the middle column of Annex 1 of The Law Concerning the Protection of the Ozone Layer Through the Control of Specified Substances and other Measures.

**Rank 2: Standards for substances whose use is restricted by conditions such as thresholds and content parts**

Relevant legislation: 2011/65/EU (RoHS), Annex II, Annex III, Annex IV, provided that Annex II shall be according to Amendment Directive 2015/863/EU.

No.	Chemical substances	Threshold value	Primary environmental effects	Primary applications
1	Cadmium and its compounds	0.01%	Kidney dysfunction Reproductive defects Carcinogenic	Pigments, anti-rust treatments, batteries
2	Hexavalent chromium compounds	0.1%	Carcinogenic	Pigments, paints, inks, catalysts
3	Lead and its compounds	0.1%	Central nervous system dysfunction Carcinogenic	Rubber curing agents, pigments, solder, plating
4	Mercury and its compounds	0.1%	Brain defects Mental disorders	Luminescence materials, electrical contacts
5	PBBs	0.1%	Bioaccumulative Production of Dioxins during combustion	Flame retardant
6	PBDEs	0.1%	Bioaccumulative Production of Dioxins during combustion	Flame retardant
7	Di (2-ethylhexyl) phthalate DEHP	0.1%	Serious influential anxiety to environment Reproductive toxicity	Plasticizers for resin, Paints, pigments, adhesives, lubricating oil additives
8	Butyl bezy phthalate BBP	0.1%	As above	As above
9	Dibutyl phthalate DBP	0.1%	As above	As above
10	Diisobutyl phthalate DIBP	0.1%	As above	As above

- It is also acceptable to keep the content rate below the threshold. (Regardless of whether it is intentional or not)
- Refer to 2011/65/EU (RoHS) Annex III and Annex IV for exemptions.

Relevant legislation: 94/62/EC (EU Packaging Waste Disposal Directive)

The threshold value shall be 0.01% by weight of the total amount of four heavy metals: cadmium, hexavalent chromium, lead, and mercury.

Relevant legislation: France Ministerial Order dated April 13, 2022 specifying substances contained in mineral oils prohibited for use in packaging materials and printed matter intended for the public.

No.	Chemical substances	Threshold value	Primary environmental effects	Primary applications
1	MOAH Mineral oil aromatic hydrocarbons with 1 to 7 aromatic rings	1%(*1) 0.1%(*2) 1ppm(*3)	Reproductive toxicity Carcinogen	<ul style="list-style-type: none"> <li>• Packaging materials, one-way advertisements, leaflets, etc.</li> <li>• General printed materials (excluding books) (*2)</li> </ul>
2	MOSH Mineral oil saturated hydrocarbons with 16 to 35 carbon atoms	0.1%(*2)		

Restrictions do not apply to procured items incorporated into products that are clearly destined for countries

other than France at this time.

\*1) Until December 31, 2024

\*2) After January 1, 2025

\*3) After January 1, 2025 Regulation value for aromatic rings from 3 to 7

Relevant legislation: 1907/2006/EC (REACH) Annex XVII

The following table shows the items in Annex XVII that may be contained in the Citizen Group's products. For details of the regulations, please refer to the original document.

No.	Chemical substances	Threshold	Main hazards	Restricted use
27	Nickel	0.88 $\mu$ g/cm <sup>2</sup> /week	Skin allergy	Molded articles that come into contact with the skin directly and for a long time.
43 · 72	Specific azo dye	0.003%	Carcinogenic	Textile and leather which are expected to come into direct contact with the skin or oral cavity for a long time
47	Hexavalent chromium	0.0003%	Carcinogenic	A leather part of a molded article including leather which is supposed to come into contact with the skin
50	Polycyclic aromatic hydrocarbons	0.0001%	Carcinogenic	Molded articles containing rubber and plastic parts that directly contact the skin and oral cavity for a long period of time and repeatedly
51	Phthalate esters	0.1%	Reproductive toxicity	Articles containing plasticizers
61	Dimethyl fumarate	0.00001%	Skin irritation	articles
63	Lead	0.05%	Central nervous system dysfunction Carcinogenic	Exterior parts of the watch touching the skin
68	Perfluorocarboxylic acids (C9-C14PFCA <sub>s</sub> ), their salts and related substances	Total of PFCA <sub>s</sub> and their salts <25 ppb Total of PFCA <sub>s</sub> and related substances <260 ppb	Persistent, Highly accumulative	Manufacture and sale of individual substances Use and sale of mixtures and molded products

(\*1) For details of the regulations, please refer to the list of specific aromatic amines in Table 1.

Table 1 List of specific aromatic amines

No.	Chemical substances	CAS No.
1	o-anisidine	90-04-0
2	2-naphthylamini	91-59-8
3	3,3'-Dichlorobenzidine	91-94-1
4	4-Aminobiphenyl	92-67-1
5	Benzidine	92-87-5
6	o-Toluidine	95-53-4
7	4-Chloro-2-methylaniline	95-69-2
8	2,4-Diaminotoluene	95-80-7
9	o-aminoazotoluene	97-56-3
10	5-Nitro-o-toluidine	99-55-8
11	3,3'-Dichloro-4,4'-Diaminodiphenylmethane	101-14-4

12	4,4'-methylenedianiline	101-77-9
13	4,4'-Diaminodiphenyl ether	101-80-4
14	p-chloroaniline	106-47-8
15	3,3'-Dimethoxybenzidine	119-90-4
16	3,3'-Dimethylbenzidine	119-93-7
17	2-methoxy-5-methylaniline	120-71-8
18	2,4,5-Trimethylaniline	137-17-7
19	4,4'-Diaminodiphenyl sulfide	139-65-1
20	2,4-Diaminoanisole	615-05-4
21	4,4'-Diamino-3,3'-dimethyldiphenylmethane	838-88-0
22	4-aminoazobenzene	60-09-3
23	2,4-Xylidine	95-68-1
24	2,6-Xylidine	87-62-7
25	2-Amino-5-chlorotoluene hydrochloride	3165-93-3
26	2-Naphthaleneamine acetic acid	553-00-4
27	4-Methoxy-1,3-benzenediamine sulfate	39156-41-7
28	2,4,5-Trimethylaniline hydrochloride	21436-97-5

**Rank 3: Standards for substances for which accurate information must be provided, as well as the identification and management of content and content parts**

EU REACH Regulations (EC) No 1907/2006 Candidate List of SVHC

If the content rate of the following substances exceeds 0.1%, it is subject to reporting.

No	Chemical substances	CAS No.	Reason	Usage Example
1	2,4-Dinitrotoluen	121-14-2	Substances classified as carcinogenic - Article 57(a)	Chemical intermediates, raw materials for organic synthesis (toluene diamine, explosive intermediates, dyes)
2	4,4'-Diaminodiphenylmethane(MDA)	101-77-9	Substances classified as carcinogenic - Article 57(a)	Curing agents for epoxy resins and polyurethane resins
3	2,4,6-Trinitro-5-t-butyl-1,3-xylene (musk xylene)	81-15-2	Persistent, bioaccumulative (vPvB) - Article 57(e)	Fragrance ingredients
4	Acrylamide	79-06-1	Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)	Synthesis of polyacrylamide, preparation of polyacrylamide gel
5	Short-chain chlorinated paraffins (carbon chain length 10-13)	85535-84-8	"Persistent, bioaccumulative and toxic (PBT) - Article 57(d) Persistent, bioaccumulative (vPvB) - Article 57(e)"	Rubber, paints, gaskets, adhesives, lubricants, flame retardants, plasticizers
6	Ammonium heptaoxide dichromate	7789-09-5	CMR - Article 57(a), (b), (c)	Manufacturing of photoconductor screen (CRT)
7	Anthracene	120-12-7	Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Dyes, catalysts, plastic products
8	Anthracene oil	90640-80-5	Article 57(a)(b)(d),(e)	
9	Anthracene oil, Paste	90640-81-6	Article 57(a)(b)(d),(e)	
10	Atlases, Petrol, Reserve points	91995-15-2	Article 57(a)(b)(d),(e)	Tar oil constituents, chemical products, impregnants, tar special paint constituents
11	Anthracene oil, paste, light distillate	91995-17-4	Article 57(a)(b)(d),(e)	
12	Atlases (Atlases with low content)	90640-82-7	Article 57(a)(b)(d),(e)	
13	Benzyl butyl phthalate (BBP)	85-68-7	Reproductive toxicity - Article 57(c) Endocrine disruptive	Plasticizers
14	Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	"Reproductive toxicity - Article 57(c). Serious effects on the environment Endocrine disrupting, PBT or vPvB - Article 57(f)"	Vinyl chloride plasticizer
15	Tributyl tin oxide (TBTO)	56-35-9	Persistent, bioaccumulative, toxicity (PBT) - Article 57(d)	Construction Industry
16	Boric acid	10043-35-3	Reproductive toxicity - Article 57(c)	Flame retardants, paints, brake fluid, soldering products, film developers
16	Boric acid	11113-50-1	Reproductive toxicity - Article 57(c)	Flame retardants, paints, brake fluid, soldering products, film developers
17	Cobalt chloride (CoCl)	7646-79-9	Carcinogenicity - Article 57(a)	Ink for invisible writing revealed by applying heat, lubricant, desiccant (used for silica gel, etc.)
18	Pentadecanoic acid dihydrogen	1303-28-2	Carcinogenicity - Article 57(a)	Dyeing, metallurgy, wood preservatives
19	Arsenic trioxide	1327-53-3	Carcinogenicity - Article 57(a)	Raw material for metallic arsenic
20	Dibutyl phthalate (DBP)	84-74-2	Reproductive toxicity - Article 57(c) Endocrine disrupting, PBT or vPvB - Article 57(f)	Plasticizers for vinyl chloride resin, etc.
21	Diisobutyl phthalate (DIBP)	84-69-5	Reproductive toxicity - Article 57(c) Endocrine disrupting, PBT or vPvB - Article 57(f)	Plasticizer, combined with other plasticizers, as a gelation accelerator, for the manufacture of plastics, explosives, and paints
22	Sodium tetraborate	1330-43-4	Reproductive toxicity - Article 57(c)	Glass and glass fiber, ceramics, detergents, personal care products, metallurgy, adhesives, flame retardants, industrial fluids
22	Sodium tetraborate pentahydrate	12179-04-3	Reproductive toxicity - Article 57(c)	Glass and glass fiber, ceramics, detergents, personal care products, metallurgy, adhesives, flame retardants, industrial fluids
22	Disodium tetraborate, decahydrate	1303-96-4	Reproductive toxicity - Article 57(c)	Glass and glass fiber, ceramics, detergents, personal care products, metallurgy, adhesives, flame retardants, industrial fluids
23	Tetraboron disodium acid hydrate	12267-73-1	Reproductive toxicity - Article 57(c)	Fire retardant
24	Hexabromic chlododecane (HBCDD) and all major diastereomers	25637-99-4	Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Fire retardant
24	Hexabromic chlododecane (HBCDD) and all major diastereomers	3194-55-6	Persistent, bioaccumulative, toxic (PBT) - Article 58(d)	Fire retardant
24	Hexabromic chlododecane (HBCDD) and all major diastereomers	134237-50-6	Persistent, bioaccumulative, toxic (PBT) - Article 58(d)	Fire retardant

No	Chemical substances	CAS No.	Reason	Usage Example
24	Hexabromic chlododecane (HBCDD) and all major diastereomers	134237-51-7	Persistent, bioaccumulative, toxic (PBT) - Article 58(d)	Fire retardant
24	Hexabromic chlododecane (HBCDD) and all major diastereomers	134237-52-8	Persistent, bioaccumulative, toxic (PBT) - Article 58(d)	Fire retardant
25	Lead chromate(II)	7758-97-6	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Dyes and pigments, pigments for paints and varnishes
26	Lead chromate molybdate sulphate (C.I. Pigment Red 104)	12656-85-8	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Pigments for paints and coatings, colorants for plastics, printing
27	Lead hydrogen arsenate(II)	7784-40-9	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Insecticides, wood preservatives, pesticides
28	Yellow lead (C.I. Pigment Yellow 34)	1344-37-2	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Pigments for paints, coatings, plastic colorants, printing
29	Coal tar pitch (high temperature)	65996-93-2	Persistent, bioaccumulative, toxic (PBT) - Article 57(d) Carcinogenicity - Article 57(a)	Electrodes, carbon products molding pigments, other graphite products, paints and coatings
30	Potassium chromate	7789-00-6	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Treatment and coating of metals, tanning and care of leather, electrodes, ink production
31	Potassium dichromate	7778-50-9	Carcinogenicity - Article 57(a)	Chromium metal manufacturing, metal processing and coating, photolithography
32	Sodium chromate	7775-11-3	Carcinogenicity - Article 57(a)	Production of other chromium compounds
33	Disodium dichromate	7789-12-0	Carcinogenicity - Article 57(a)	Production of chromic acid compounds (chromium sulfate), production of inorganic chromic acid pigments
33	Disodium dichromate	10558-01-9	Carcinogenicity - Article 57(a)	Production of chromic acid compounds (chromium sulfate), production of inorganic chromic acid pigments
34	Trichloroethylene	79-01-6	Carcinogenicity - Article 57(a)	Cleaning or degreasing agent
35	Triethyl arsenate	15606-95-8	Carcinogenicity - Article 57(a)	Pesticide, wood rod, semiconductor.
36	Tris(2-chloroethyl) phosphate (TCEP)	115-96-8	Reproductive toxicity - Article 57(c)	Fire retardant, plasticizer, adhesive
37	Cobalt(III) sulfate	10124-43-3	Carcinogenicity - Article 57(a)	Manufacturing of chemicals, catalysts and drying materials, surface treatment (e.g. electroplating), corrosion protection, production of pigments, bleaching (glass, ceramics), batteries, animal nutrition supplements, chemical fertilizers
38	Cobalt(III) nitrate	10141-05-6	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Manufacture of chemicals and catalysts, surface treatment, batteries
39	Cobalt carbonate (II)	513-79-1	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Manufacture of catalysts, manufacture of chemicals, manufacture of pigments, adhesives (ground coat frit)
40	Cobalt acetate (II)	71-48-7	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Catalyst manufacturing, chemical manufacturing, surface treatment, alloys, pigments, paints, dyes, rubber adhesives, feed additives
41	2-Methoxyethanol Methyl cellosolve	109-86-4	Reproductive toxicity - Article 57(c)	Solvents, intermediate chemicals, fuel additives
42	2-Ethoxyethanol Cellosolve	110-80-5	Reproductive toxicity - Article 57(c)	Solvents, intermediate chemicals
43	Chromium trioxide Chromic anhydride (VI)	1333-82-0	Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)	Metal finishing, waterborne wood preservative fixative
44	Acid produced from chromium trioxide and its oligomers (Chromic acid) (Dichromic acid, Dichromic acid) (Oligomers of chromic acid and dichromic acid)	7738-94-5	Carcinogenicity - Article 57(a)	Dissolution of chromium trioxide
44	Acid produced from chromium trioxide and its oligomers (Chromic acid) (Dichromic acid, Dichromic acid) (Oligomers of chromic acid and dichromic acid)	13530-68-2	Carcinogenicity - Article 57(a)	Dissolution of chromium trioxide
45	2-ethoxyethyl acetate (cellosolve acetate)	111-15-9	Carcinogenicity - Article 57(a)	Solvents for paints, printing inks and electronic materials (for resist inks), coating solvents, intermediates for instant adhesives
46	Strontium chromate	7789-06-2	Carcinogenicity - Article 57(a)	Anti-corrosive pigments
47	Di-C7-11-branched and linear alkyl esters (DHNU: including 1,2-benzenecarboxylic acid)	68515-42-4	Carcinogenicity - Article 57(a)	Plasticizers (PVC, bubble rubber, adhesives, coatings)
48	Hydralazine · hydrate	7803-57-8	Carcinogenicity - Article 57(a)	Raw materials for foaming agents, detergents, water treatment agents, synthetic raw materials for industrial chemicals, synthetic raw materials for agricultural chemicals, synthetic raw materials for pharmaceuticals, etc.
48	Hydrazine	302-01-2	Carcinogenicity - Article 57(a)	
49	1-Methyl-2-pyrrolidone (NMP)	872-50-4	Carcinogenicity - Article 57(a)	Resin solvents, acetylene solvents, solvents for MOS semiconductor manufacturing, base materials for cosmetics
50	1,2,3-Trichloropropane	96-18-4	Carcinogenicity - Article 57(a)	Cleaning agents, plasticizer raw materials
51	1,2-Benzenedicarboxylic acid, 6 to 8-carbon side-chain alkyl esters consisting mainly of 7-carbon side-chain hydrocarbons 1,2-Benzenedicarboxylic acid with 6 to 8 carbon atoms	71888-89-6	Carcinogenicity - Article 57(a)	Plasticizers (PVC, sealants, coatings, inks)

No	Chemical substances	CAS No.	Reason	Usage Example
52	4-(1,1,3,3-tetramethylbutyl)phenol (4-tert-octylphenol)	140-66-9	Endocrine disrupting, PBT or vPvB - Article 57(f)	Manufacturing of polymer formulations and ethoxylates
53	2-methoxyaniline	90-04-0	Carcinogenicity - Article 57(a)	Manufacture of dyes for colored papers, polymers and aluminum foils
54	Arsenic acid	7778-39-4	Carcinogenicity - Article 57(a)	For the removal of air bubbles from ceramic glass melts and the manufacturing of laminated printed circuit boards
55	Calcium arsenate	7778-44-1	Carcinogenicity - Article 57(a)	Metal refining process for the condensation of nickel from molten copper
56	Lead arsenate	3687-31-8	Carcinogenicity - Article 57(a) Reproductive toxicity - Article 57(c)	Manufacturing of copper, lead, and many precious metals
57	1,2-Dichloroethane	107-06-2	Carcinogenicity - Article 57(a)	Raw materials for synthesis, solvents, etc.
58	Bis(2-methoxyethyl) ether	111-96-6	Reproductive toxicity - Article 57(c)	Used as a reaction solvent or for chemical processing in a wide range of applications, and as an electrolyte in batteries
59	Bis(2-methoxyethyl) phthalate	117-82-8	Reproductive toxicity - Article 57(c)	Plasticizers for paints, lacquers and varnishes (including printing inks)
60	N,N-dimethylacetamide	127-19-5	Reproductive toxicity - Article 57(c)	Used as a solvent and for industrial coatings, polyimide thin films, paint removers and ink removers
61	Aniline-formaldehyde polycondensation product	25214-70-4	Carcinogenicity - Article 57(a)	Raw materials for synthesis, e.g. curing agents for epoxy resins
62	Lead azide	13424-46-9	Reproductive toxicity - Article 57(c)	Detonators and pyrotechnic devices
63	Lead trinitro-resorcinol	15245-44-0	Reproductive toxicity - Article 57(c)	Ammunition, fireworks and detonators
64	2,2'-Dichloro-4,4'-methylenedianiline	101-14-4	Carcinogenicity - Article 57(a)	Used as a curing agent for resins (such as urethane) and in the production of polymer products
65	Chromium(III) (chromic acid)	24613-89-6	Carcinogenicity - Article 57(a)	Mixtures for metal surface treatment in the aerospace, steel and aluminum coating sectors
66	Potassium hydroxyoctaoxodizine acid dichromate	11103-86-9	Carcinogenicity - Article 57(a)	Manufacturing of aerospace, steel and aluminum coils and automotive coatings, paint films and sealants
67	Pentazinc chromate octahydroxide	49663-84-5	Carcinogenicity - Article 57(a)	Manufacturing of automotive coatings, paint films, paints and thinners
68	Phenolphthalein	77-09-8	Carcinogenicity - Article 57(a)	Used as a laboratory agent (in pH indicator solutions) for the production of pH test papers and as a medical indicator
69	Aluminosilicate Refractory Ceramic Fibres	(See CLP Regulation (EC) No 1272/2008ANNEX IV Table 3.1 650-017-00-8)	Carcinogenicity - Article 57(a)	High temperature insulation materials for industrial applications and fire protection
70	Zirconia Aluminosilicate Refractory Ceramic Fibres	(See CLP Regulation (EC) No 1272/2008ANNEX IV Table 3.1 650-017-00-8)	Carcinogenicity - Article 57(a)	High temperature insulation materials for industrial use and fire protection
71	Lead niplerate	6477-64-1	Reproductive toxicity - Article 57(c)	Detonators
72	1,2 - Bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	Reproductive toxicity - Article 57(c)	Processing aids in the manufacture and formulation of solvents and industrial chemicals. Miner, used in brake fluid and motor vehicle repair
73	1,2 - dimethoxyethane, ethylene glycol dimethyl ether (EGDME)	110-71-4	Reproductive toxicity - Article 57(c)	Solvent, used as a processing aid in the manufacture and formulation of industrial chemicals, including use as a solvent electrolyte in lithium batteries
74	Boron oxide	1303-86-2	Reproductive toxicity - Article 57(c)	Fungicides and insecticides used in numerous applications in glass and glass fiber, frit, ceramics, fire retardant, catalysts, industrial fluids, metallurgy, nuclear power, electrical equipment, adhesives, inks/paints, film developers, detergents, cleaners, reagent chemicals, etc.
75	Formamide	75-12-7	Reproductive toxicity - Article 57(c)	Used as intermediates in the manufacture of pesticides, pharmaceuticals and industrial chemicals. Used as laboratory reagents and solvents for quality control purposes in forensic laboratories, hospitals, pharmaceutical companies, food and beverage manufacturers and research institutions. Used as plasticizer.
76	Lead(II) methane sulfonate	17570-76-2	Reproductive toxicity - Article 57(c)	Mainly used in plating processes (both electrolytic and electroless) for electronic components (e.g., printed circuit boards). Used in batteries for special applications.
77	1,3,5-Tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione (TGIC)	2451-62-9	Mutagenicity - Article 57(b)	Curing agents for resins and paints. Printed circuit board industry, electrical insulation materials, resin molding systems, laminated sheets, silkscreen printing paints, tools, adhesives, lining materials and plastic stabilizers.

No	Chemical substances	CAS No.	Reason	Usage Example
78	1,3,5-Tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (6-TGIC)	59653-74-6	Mutagenicity - Article 57(b)	Used as solder mask ink in the EU. Used in plastic molding systems, laminated sheets, silk screen printing, paints, tools, adhesives, lining materials and stabilizers for plastics, and electrical insulating materials.
79	4,4'-Bis(dimethylamino)benzophenone	90-94-8	Carcinogenicity - Article 57(a)	Used as an intermediate in the manufacture of triphenylmethane dyes and other substances. Potential uses include use as a dye and pigment additive (photosensitizer) in dry film products and as a process chemical in the manufacture of electronic circuit boards.
80	N,N,N',N'-Tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	Carcinogenicity - Article 57(a)	Used as intermediates in the manufacture of dyes and other substances
81	C.I. Basic Blue 26	2580-56-5	Carcinogenicity - Article 57(a)	Used in the formulation of inks, cleaners and coatings, as well as in dyeing, diagnostic and analytical applications for paper, packaging, textiles, plastic products and fabrics
82	C.I. Basic Violet 3	548-62-9	Carcinogenicity - Article 57(a)	Used for paper coloration and as supply ink for printer cartridges and ballpoint pens. Staining of dry plants, staining in microbiological and clinical laboratories, used as a marker to enhance the visibility of liquids
83	4,4'-Bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1	Carcinogenicity - Article 57(a)	Used in writing formulations for staining various materials, as well as other inks
84	C.I. Solvent Blue 4	6786-83-0	Carcinogenicity - Article 57(a)	Used in mixtures as a windshield washer, for dyeing paper, printing inks and writing formulations
85	Decabromodiphenyl ether (decaBDE)	1163-19-5	Persistent, bioaccumulative (vPvB) - Article 57(e)	Fire retardant for polystyrene, ABS resin, polyester, adhesive, sealant, textile coating
86	Pentacosafuorotridecanoic acid, Perfluorotridecanoic acid, Perfluorotridecanoic acid	72629-94-8	Persistent, bioaccumulative (vPvB) - Article 57(e)	Surfactant
87	Tricosafuorododecanoic acid, Perfluorododecanoic acid, Perfluorododecanoic acid	307-55-1	Persistent, bioaccumulative (vPvB) - Article 57(e)	Surfactant
88	Henicosafuoroundecanoic acid, Perfluoroundecanoic acid, Perfluoroundecanoic acid	2058-94-8	Persistent, bioaccumulative (vPvB) - Article 57(e)	Surfactant
89	Heptacosafuorotetradecanoic acid, Perfluorotetradecanoic acid, Perfluorotetradecanoic acid	376-06-7	Persistent, bioaccumulative (vPvB) - Article 57(e)	Surfactant
90	Azodicarbonamide, Azobisformamide, Diazene-1,2-bis-carboamide	123-77-3	Endocrine disrupting, PBT or vPvB - Article 57(f)	Foaming agent for rubber and synthetic resins
91	[1] Cyclohexane-1,2-dicarboxylic anhydride [2] Cis-cyclohexane-1,2-dicarboxylic anhydride [3] Trans-cyclohexane-1,2-dicarboxylic anhydride [Individual isomers of the cis [2] and trans [3] forms and all possible combinations of cis and trans isomers [1]. All of the isomers are covered by this entry].	85-42-7 13149-00-3 14166-21-3	Endocrine disrupting, PBT or vPvB - Article 57(f)	Pharmaceuticals, agrochemicals, anthelmintics, raw materials for alkyd resins, plasticizers, rust inhibitors, resin modifiers, alkyd resins
92	[1] Methylhexahydrophthalic anhydride [2] Hexahydro-4-methylphthalic anhydride [3] Hexahydro-1-methylphthalic anhydride [4] Hexahydro-3-methylphthalic anhydride [[2], individual isomers of [3] and [4] (including their cis and trans stereoisomers) and all possible combinations of isomers [1]. All of the isomers are covered by this entry].	25550-51-0 19438-60-9 48122-14-1	Endocrine disrupting, PBT or vPvB - Article 57(f)	Epoxy resin curing agents, polyester coating materials
93	4-Nonylphenol, branched and linear 4-Nonylphenol, branched and linear [substances with a covalently bonded 9-carbon linear and/or branched alkyl chain at position 4 of phenol, including both individual isomers or mixtures of isomers, and well-defined substances (substances of known composition, etc.)	7311-27-5 68412-54-4 26027-38-3 9016-45-9 9016-45-9 68412-54-4 14409-72-4 20427-84-3 27942-27-4 104-35-8 156609-10-8 20636-48-0 127087-87-0 1119449-38-5 1119449-37-4 127087-87-0 9016-45-9 37205-87-1 34166-38-6 27177-05-5 26571-11-9 26264-02-8	Endocrine disrupting, PBT or vPvB - Article 57(f)	Surfactant, resin, modifier raw materials, adhesives, paints, inks, rubber additives
94	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylate 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylate [well-defined substances (substances of known composition, etc.) and UVCB substances, polymers and their homologues		Endocrine disrupting, PBT or vPvB - Article 57(f)	Emulsifiers, Intermediates
95	Methoxyacetic acid	625-45-6	Reproductive toxicity - Article 57(c)	Organic synthetic intermediates

No	Chemical substances	CAS No.	Reason	Usage Example
96	N,N-dimethylformamide	68-12-2	Reproductive toxicity - Article 57(c)	Solvents (for urethane synthetic leather, dye intermediates, agricultural chemicals, pharmaceutical synthesis, various polymers, special inks, textile printing), catalysts, gas absorbers
97	Dibutyltin dichloride, dichlorodibutyltin (DBTC)	683-18-1	Reproductive toxicity - Article 57(c)	Vinyl chloride stabilizer intermediates, catalysts, rubber additives
98	Lead monoxide (Lead(II) oxide)	1317-36-8	Reproductive toxicity - Article 57(c)	Inorganic pigments, paints, raw materials for PVC stabilizers, solid lubricants, vulcanization promoters for synthetic rubber, raw materials for glass, batteries, raw materials for varnishes for glass and ceramics, radiation shielding agents
99	Orange red (lead tetroxide)	1314-41-6	Reproductive toxicity - Article 57(c)	Electronic materials, paints, glass materials, batteries
100	Lead bismetrafluoroborate, lead borofluoride	13814-96-5	Reproductive toxicity - Article 57(c)	Tin plating chemicals, solder plating chemicals
101	Lead bis(carbonate)trihydroxide, basic lead carbonate, lead carbonate hydroxide, lead subcarbonate	1319-46-6	Reproductive toxicity - Article 57(c)	Pigments for ceramics, paints, etc., raw materials for electronic materials
102	Lead titanium trioxide, lead titanate	12060-00-3	Reproductive toxicity - Article 57(c)	Raw materials for semiconductors
103	Lead zirconium titanate, lead zirconate titanate	12626-81-2	Reproductive toxicity - Article 57(c)	Raw materials for semiconductors
104	Lead silicate, basic lead silicate	11120-22-2	Reproductive toxicity - Article 57(c)	Pigment, paint desiccant, crystal work, glass raw materials
105	Barium silicate (Limited conditions: 1:1 composition ratio, doped with lead, with lead concentration above the threshold concentration for reproductive threshold concentration for reproductive toxicity)	68784-75-8	Reproductive toxicity - Article 57(c)	Bulb lamp coating
106	1-Bromopropane (n-propyl bromide)	106-94-5	Reproductive toxicity - Article 57(c)	Raw materials for pharmaceuticals and agrochemicals, intermediates, cleaning and degreasing
107	Methyloxirane (propylene oxide)	75-56-9	Reproductive toxicity - Article 57(c)	Polyester Resin, Urethane Resin Raw Materials, Surfactant, Solvent Raw Materials, Pigment, Pharmaceutical Intermediates Raw Materials
108	Dipentyl phthalate, branched and linear	84777-06-0	Reproductive toxicity - Article 57(c)	Plasticizer
109	Diisopentyl phthalate (DIPP)	605-50-5	Reproductive toxicity - Article 57(c)	Plasticizer
110	n-pentyl-isopentyl phthalate	776297-69-9	Reproductive toxicity - Article 57(c)	Plasticizer
111	1,2-Diethoxyethane, diethyl glycol, diethyl cellosolve	629-14-1	Reproductive toxicity - Article 57(c)	Solvents for nitrocellulose, rubber, resin, etc., organic synthetic reaction solvents
112	Basic lead acetate	51404-69-4	Reproductive toxicity - Article 57(c)	Paints, coatings, fillers, intermediates
113	Lead oxy sulphate	12036-76-9	Reproductive toxicity - Article 57(c)	PVC additives
114	Lead dioxide trilead phthalate	69011-06-9	Reproductive toxicity - Article 57(c)	PVC additives
115	Lead dioxobis(stearate)trilead, lead dioxobis(stearate)trilead	12578-12-0	Reproductive toxicity - Article 57(c)	PVC additives
116	Lead fatty acid salts (16-18 carbon atoms)	91031-62-8	Reproductive toxicity - Article 57(c)	PVC additives
117	Lead cyanamide	20837-86-9	Reproductive toxicity - Article 57(c)	Anti-corrosive pigments
118	Lead dinitrate, lead(II) nitrate	10099-74-8	Reproductive toxicity - Article 57(c)	Raw materials for lead compounds, raw materials for matches, explosives, optical glasses, reagents, pigments
119	Tetrabasic lead sulfate	12065-90-6	Reproductive toxicity - Article 57(c)	PVC additives, Batteries
120	Pyrochlore, C.I. Pigment Yellow 41	8012-00-8	Reproductive toxicity - Article 57(c)	Coatings, paints, ceramics
121	Basic lead sulfite	62229-08-7	Reproductive toxicity - Article 57(c)	PVC additives, resins
122	Tetraethyl lead, Tetraethyl lead	78-00-2	Reproductive toxicity - Article 57(c)	Anti-knock agents (gasoline octane improvers), fuel additives
123	Tribasic lead sulfate	12202-17-4	Reproductive toxicity - Article 57(c)	PVC additives, batteries
124	Dibasic lead phosphate, dibasic lead phosphate	12141-20-7	Reproductive toxicity - Article 57(c)	PVC additives
125	Furan	110-00-9	Carcinogenicity - Article 57(a)	Raw materials for synthetic resins, raw materials for organic synthesis, solvents, detergents
126	Diethyl sulfate	64-67-5	"Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)"	Ethylating agents, relaxant dehydrating agents, intermediates
127	Dimethyl sulfate	77-78-1	Carcinogenicity - Article 57(a)	Methylating agents for organic synthesis, pharmaceuticals (raw materials), intermediates

No	Chemical substances	CAS No.	Reason	Usage Example
128	3-ethyl-2-isopentyl-2-methyl-1,3-oxazolidine	143860-04-2	Reproductive toxicity - Article 57(c)	—
129	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	Reproductive toxicity - Article 57(c)	Agrochemical intermediates (expired agrochemicals)
130	4,4'-methylenedi-o-toluidine, 4,4'-diamino-3,3'-dimethyldiphenylmethane	838-88-0	Carcinogenicity - Article 57(a)	Curing Agents for Epoxy and Urethane Resins, Synthetic Resin Intermediates
131	4,4'-oxydianiline and its salts	101-80-4	Reproductive toxicity - Article 57(c) Mutagenicity - Article 57(b)	Organic synthetic intermediates, raw materials for polyimide resin
132	4-aminoazobenzene	60-09-3	Reproductive toxicity - Article 57(c)	Dyes, pigments, intermediates
133	4-Methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	Carcinogenicity - Article 57(a)	Raw materials for polyurethane resins, synthetic intermediates for dyes and pigments
134	6-methoxy-m-toluidine (p-cresidine)	120-71-8	Carcinogenicity - Article 57(a)	Dye raw materials, intermediates
135	Biphenyl-4-ylamine	92-67-1	Carcinogenicity - Article 57(a)	—
136	o-aminoazotoluene (4-o-tolyl azo-o-toluidine)	97-56-3	Carcinogenicity - Article 57(a)	Dyestuffs
137	o-Toluidine	95-53-4	Carcinogenicity - Article 57(a)	Raw materials for intermediates of dyes and pigments, raw materials for epoxy resin curing agents
138	N-methylacetamide, methylacetylamine	79-16-3	Reproductive toxicity - Article 57(c)	Azo and sulfide dye intermediates
139	Cadmium	7440-43-9	Carcinogenicity - Article 57(a)	Pharmaceutical intermediates
140	Cadmium oxide	1306-19-0	Carcinogenicity - Article 57(a)	Pigments, batteries, alloys (nuclear reactor control materials, bearings, etc.), plating, phosphors, electronics industry
141	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	Reproductive toxicity - Article 57(c)	Cadmium plating bath additives, pigments, catalysts, alkaline batteries
142	Perfluorooctanoic acid (PFOA)	335-67-1	Reproductive toxicity - Article 57(c)	For semiconductors, fire extinguishing agents, water repellents, paper surface treatment agents, resin modifiers
143	Dipentyl phthalate (DPP)	131-18-0	Reproductive toxicity - Article 57(c)	Plasticizer
144	4-Nonylphenol, branched and linear ethoxylates	104-40-5 30784-30-6 26543-97-5 17404-66-9 52427-13-1 186825-36-5 142731-63-3 84852-15-3 11066-49-2 186825-39-8 25154-52-3 90481-04-2 521947-27-3	Endocrine disrupting, PBT or vPvB - Article 57(f)	Raw materials for soaps, detergents and surfactants, textile processing agents, agricultural chemical extenders, quasi-drug additives (emulsifiers for cosmetics)
145	Cadmium sulfide	1306-23-6	Carcinogenicity - Article 57(a)	Pigments (high-grade paints, synthetic resins, glass)
146	Dihexyl phthalate (DnHP)	84-75-3	Reproductive toxicity - Article 57(c)	Plasticizer
147	3,3'-[(1,1'-Biphenyl)-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulfonate) disodium (C.I. Direct Red 28)	573-58-0	Carcinogenicity - Article 57(a)	Direct dyes, biological dyes
148	Disodium 4-amino-3-[4'-(2,4-diaminophenyl azo)-1,1'-biphenyl-4-yl azo]-5-hydroxy-6-phenyl azo-2,7-naphthalene disulfonate (C.I. Direct Black 38)	1937-37-7	Carcinogenicity - Article 57(a)	Dyes
149	Ethylene thiourea (2-imidazolidinedione)	96-45-7	Reproductive toxicity - Article 57(c)	Imidazoline vulcanization accelerators (chloroprene rubber, epichlorohydrin rubber, chlorinated polyethylene), organic rubber chemicals (vulcanization accelerators)
150	Lead(II) acetate	301-04-2	Reproductive toxicity - Article 57(c)	Raw materials for lead compounds, waterproofing agents, analytical reagents, pharmaceuticals (astringents)
151	Tris(dimethylphenyl) phosphate	25155-23-1	Reproductive toxicity - Article 57(c)	Plasticizer, raw material for flame retardant hydraulic oil
152	Cadmium chloride	10108-64-2	CMR - Article 57(a), (b), (c)	Plating, catalyst
153	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	CMR - Article 57(a), (b), (c)	Plasticizer
154	Sodium peroxoborate; sodium perborate	7632-04-4	CMR - Article 57(a), (b), (c)	Oxidizing bleach, cleaning and disinfecting agents, preservatives, dyeing aids
155	Sodium perborate; perboric acid, sodium salt	15120-21-5 11138-47-9	CMR - Article 57(a), (b), (c)	Oxidizing bleach, cleaning and disinfecting agents, preservatives, dyeing aids
156	Cadmium fluoride	7790-79-6	CMR - Article 57(a), (b), (c)	Glass, solar cells, alloys, etc.
157	Cadmium(II) sulfate	10124-36-4	CMR - Article 57(a), (b), (c)	Raw materials for inorganic cadmium compounds, metal surface treatment materials
157	Cadmium(II) sulfate	31119-53-6	CMR - Article 57(a), (b), (c)	Raw materials for inorganic cadmium compounds, metal surface treatment materials
158	2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	"Persistent, bioaccumulative, toxic (PBT) - Article 57(d) Persistent, bioaccumulative (vPvB) - Article 57(e)"	UV stabilizers, UV protectants

No	Chemical substances	CAS No.	Reason	Usage Example
159	2-(2H-Benzotriazol-2-yl)-4,6-di-tert-pentylphenol (UV-328)	25973-55-1	"Persistent, bioaccumulative, toxic (PBT) - Article 57(d) Persistent, bioaccumulative (vPvB) - Article 57(e)"	UV stabilizers, UV protectants, light stabilizers in coatings
160	10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoic acid 2-ethylhexyl (DOTE)	15571-58-1	Reproductive toxicity - Article 57(c)	Heat Stabilizer for PVC
161	Reaction product of 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoic acid 2-ethylhexyl and 10-ethyl-4-[[2-[(ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoic acid 2-ethylhexyl (reaction product of DOTE and MOTE)		Reproductive toxicity - Article 57(c)	Heat stabilizer for PVC, Biocide in antifouling paints
162	1,2-Benzenedicarboxylic acid, di-C6-10-alkyl ester; mixture of 1,2-benzenedicarboxylic acid, decyl-hexyl-octyl diester and more than 0.3% dihexyl phthalate (EC No. 201-559-5)	68515-51-5 68648-93-1	Reproductive toxicity - Article 57(c)	Lubricants, Adhesives, Coating materials
163	5-sec-butyl-2-(2,4-dimethylcyclohexa-3-en-1-yl)-5-methyl-1,3-dioxane[1], 5-sec-butyl-2-(4,6-dimethylcyclohexa-3-en-1-yl)-5-methyl-1,3-dioxane[2] (including individual isomers of [1] and [2], or combinations thereof)		Persistent, bioaccumulative (vPvB) - Article 57(e)	Flavoring ingredients
164	Nitrobenzene	98-95-3	Reproductive toxicity - Article 57(c)	Manufacture of other substances
165	2,4-Di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	Persistent, bioaccumulative (vPvB) - Article 57(e)	UV protectants (paints, plastics, rubber, cosmetics)
166	2-(2H-Benzotriazol-2-yl)-6-sec-butyl-4-tert-butylphenol (UV-350)	36437-37-3	Persistent, bioaccumulative (vPvB) - Article 57(e)	UV (ultraviolet) light protectant (paints, plastics, rubber, cosmetics)
167	1,3-propanesultone	1120-71-4	Carcinogenicity - Article 57(a)	Electrolyte solution for lithium batteries
168	Perfluorononanoic acid and its sodium and ammonium salts	-	Reproductive toxicity - Article 57(c) PBT (- Article 57(d))	Processing aids: fluoropolymer manufacturing, lubricant additives, Surfactant for fire extinguishers, detergents, fabric stain inhibitors, polishing Surfactant, waterproof materials, liquid crystal display panels
168	Perfluorononanoic acid and its sodium and ammonium salts	375-95-1	Reproductive toxicity - Article 57(c) PBT (- Article 57(d))	Processing aids: fluoropolymer manufacturing, lubricant additives, Surfactant for fire extinguishers, detergents, fabric stain inhibitors, polishing Surfactant, waterproof materials, liquid crystal display panels
168	Perfluorononanoic acid and its sodium and ammonium salts	21049-39-8	Reproductive toxicity - Article 57(c) PBT (- Article 57(d))	Processing aids: fluoropolymer manufacturing, lubricant additives, Surfactant for fire extinguishers, detergents, fabric stain inhibitors, polishing Surfactant, waterproof materials, liquid crystal display panels
168	Perfluorononanoic acid and its sodium and ammonium salts	4149-60-4	Reproductive toxicity - Article 57(c) PBT (- Article 57(d))	Processing aids: fluoropolymer manufacturing, lubricant additives, Surfactant for fire extinguishers, detergents, fabric stain inhibitors, polishing Surfactant, waterproof materials, liquid crystal display panels
169	Benzo(def)chrysene Benzo(a)pyrene Benzo(pqr)tetraphene	50-32-8	Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b) Reproductive toxicity - Article 57(c) PBT (- Article 57(d)) vPvB (- Article 57(e))	Byproducts of carbon black production, etc.
170	4,4'-isopropylidene diphenol (Bisphenol A, BPA)	80-05-7	Reproductive toxicity - Article 57(c) Endocrine disrupting, PBT or vPvB - Article 57(f)	Polycarbonate, epoxy resin manufacturing, epoxy resin hardener manufacturing
171	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	-	Reproductive toxicity - Article 57(c) Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Lubricant, Wetting agent, Plasticizer, Antiseptic
171	Nonadecafluorodecanoic acid	335-76-2	Reproductive toxicity - Article 57(c) Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Lubricant, Wetting agent, Plasticizer, Antiseptic
171	Sodium salts of decanoic acid and nonadecafluorodecanoic acid	3830-45-3	Reproductive toxicity - Article 57(c) Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Lubricant, Wetting agent, Plasticizer, Antiseptic
171	Ammonium Nonadecafluorodecanoate	3108-42-7	Reproductive toxicity - Article 57(c) Persistent, bioaccumulative, toxic (PBT) - Article 57(d)	Lubricant, Wetting agent, Plasticizer, Antiseptic
172	4-tert-pentylphenol (PTAP)	80-46-6	Endocrine disrupting, PBT or vPvB - Article 57(f)	Manufacture of chemicals and plastics
172	4-tert-pentylphenol (PTAP)	30784-30-6	Endocrine disrupting, PBT or vPvB - Article 57(f)	
173	4-heptylphenol, branched and linear (4-HPbl)	-	Endocrine disrupting, PBT or vPvB - Article 57(f)	Manufacture of polymers; lubricants
174	Perfluorobutane sulfonic acid and its salts	-	Persistent, bioaccumulative (vPvB) - Article 57(e)	Plasticizer and lubricant; Surfactant, wetting agent, preservative, digestive agent
175	1,3,4-Thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [0.1% w/w 4-heptylphenol, branched and linear]	-	Endocrine disrupting, PBT or vPvB - Article 57(f)	Used as additives in lubricants and greases

No	Chemical substances	CAS No.	Reason	Usage Example
176	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo [12.2.1.1.6.9.0 2,13.0.5,10]octadeca7,15diene ("Dechlorane Plus" TM) [any of its individual anti- and syn-isomers Any of its individual anti- and syn-isomers, or any combination thereof].	13560-89-9 135821-03-3 135821-74-8	Persistent, bioaccumulative (vPvB) - Article 57(e)	Unplasticized fire retardants, used as adhesives and sealants, binding materials
177	Chrysene	218-01-9	"Carcinogenicity - Article 57(a) PBT (- Article 57(d)) vPvB (- Article 57e)"	Usually not intentionally produced, but occur as constituents or impurities in other substances
178	Cadmium nitrate	10325-94-7	"Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)"	Used in the manufacture of glass, porcelain and ceramic products and in research chemicals
179	Cadmium hydroxide	21041-95-2	"Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)"	Used in the manufacture of electrical, electronic, and optical equipment and in research chemicals
180	Cadmium carbonate	513-78-0	"Carcinogenicity - Article 57(a) Mutagenicity - Article 57(b)"	Used in pH adjusters, water treatment products, research chemicals, cosmetics, and personal care products
181	Benz[a]anthracene Benz[a]anthracene	56-55-3	"Carcinogenicity - Article 57(a) PBT (- Article 57(d)) vPvB (- Article 57e)"	Usually not intentionally produced, but occur as components or impurities in other substances
182	Octamethylcyclotetrasiloxane (D4)	556-67-2	"PBT (- Article 57(d)) vPvB (- Article 57e)"	Cleaning and cleaning products, abrasives, waxes, cosmetics and personal care products applications
183	Decamethylcyclopentasiloxane (D5)	541-02-6	"PBT (- Article 57(d)) vPvB (- Article 57e)"	Cleaning and cleaning products, abrasives, waxes, cosmetics and personal care products, textile treatment products and dyestuff applications
184	Dodecamethylcyclohexasiloxane (D6)	540-97-6	"PBT (- Article 57(d)) vPvB (- Article 57e)"	For cleaning and polishing products, waxes, cosmetics and personal care products.
185	Lead	7439-92-1	Reproductive toxicity (- Article 57c)	Metal, welding and soldering products, metal surface treatment products and polymer applications
186	Disodium octaborate	12008-41-2	Reproductive toxicity (- Article 57c)	Anti-freeze products, heat transfer fluids, lubricants and greases, washing and cleaning products
187	Benzo[ghi]perylene	191-24-2	"PBT (- Article 57(d)) vPvB (- Article 57e)"	No registration under REACH. Usually not intentionally produced, but occurs as a constituent or impurity of other substances.
188	Terphenyl hydride	61788-32-7	vPvB (- Article 57e)	Plastic additives, solvents, applications in paints/inks, applications in adhesives and sealants, heat transfer fluids
189	Ethylenediamine (EDA)	107-15-3	Endocrine disrupting, PBT or vPvB - Article 57(f)	Adhesives and sealants, coating products, filters, putty, plaster, clay, pH adjusters and water treatment product applications
190	Benzene-1,2,4-tricarboxylic acid-1,2-anhydride (trimellitic anhydride)	552-30-7	Endocrine disrupting, PBT or vPvB - Article 57(f)	Ester and polymer manufacturing applications
191	Dicyclohexyl phthalate	84-61-7	Endocrine disrupting, PBT or vPvB - Article 57(f)	Plastisol, PVC, rubber and plastic molded product applications. As a reactive desensitizer and dispersant in organic peroxide formulations.
192	4,4'-(4-methylpentane-2,2-diyl)diphenol	6807-17-6	Reproductive toxicity (- Article 57c)	
193	Benzo[k]fluoranthene	207-08-9	"Carcinogenic (- Article 57a)PBT (- Article 57(d)) vPvB (- Article 57e)"	
194	Fluoranthene	206-44-0	"PBT (- Article 57(d)) vPvB (- Article 57e)"	
195	Phenanthrene	85-01-8	vPvB (- Article 57e)	
196	Pyrene	129-00-0	"PBT (- Article 57(d)) vPvB (- Article 57e)"	Transportation intermediates for the manufacture of refined chemical products (fine chemicals)
197	1,7,7-Trimethyl-3-benzylidenebicyclo[2.2.1]heptan-2-one	15087-24-8	Endocrine disrupting, PBT or vPvB - Article 57(f)	
198	2-Methoxyethyl acetate	110-49-6	Reproductive toxicity (- Article 57c)	
199	Tris(linear, branched-chain 4-nonylphenyl) phosphite (TNPP) containing more than 0.1% by weight of branched and linear 4-nonylphenol		Endocrine disrupting, PBT or vPvB - Article 57(f)	Mainly used as an antioxidant to stabilize polymers
200	2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propionic acid and its salts and acid halides [including individual isomers and combinations thereof] (HFPO-DA)		Endocrine disrupting, PBT or vPvB - Article 57(f)	Processing aids in the production of fluorinated polymers.
201	4-tert-butylphenol (PTBP)	98-54-4	Endocrine disrupting, PBT or vPvB - Article 57(f)	Applications for coated products, polymers, adhesives, sealants, and for the synthesis of other substances.
202	Diisohexyl phthalate	71850-09-4	Reproductive toxicity (- Article 57c)	
202	Diisobutyl phthalate	84-69-5	Reproductive toxicity (- Article 57c)	
202	Diisobutyl phthalate	605-50-5	Reproductive toxicity (- Article 57c)	
203	2-Benzyl-2-(N,N-dimethylamino)-1-(4-morpholinophenyl)butan-1-one	119313-12-1	Reproductive toxicity (- Article 57c)	Used for polymer production

No	Chemical substances	CAS No.	Reason	Usage Example
204	2-Methyl-1-[4-(methylthio)phenyl]-2-morpholino-1-propanone	71868-10-5	Reproductive toxicity (- Article 57c)	Used in polymer production
205	Perfluorobutane sulfonic acid (PFBS) and its salts		Endocrine disrupting, PBT or vPvB - Article 57(f)	Fire retardant in polycarbonate (for electrical and electronic equipment), catalyst, additive and reactant in polymer production and chemical synthesis.
206	1-Vinylimidazole	1072-63-5	Reproductive toxicity - Article 57(c)	
207	2-Methylimidazole	693-98-1	Reproductive toxicity - Article 57(c)	
208	Butyl 4-hydroxybenzoate	94-26-8	Endocrine disrupting, PBT or vPvB - Article 57(f)	
209	Dibutyl bis(2,4-pentanedionato)tin(IV)	22673-19-4	Reproductive toxicity - Article 57(c)	
210	Bis(2-(2-methoxyethoxy)ethyl)ether	143-24-8	Reproductive toxicity - Article 57(c)	
211	Diocetyl tin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivatives and other stannane, dioctyl-, bis(fatty acid acyloxy) derivatives (the main carbon number of the fatty acid acyloxy moiety therein is C12)		Reproductive toxicity - Article 57(c)	
212	2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	80-54-6	Reproductive toxicity - Article 57(c)	
213	Orthoboric acid, sodium salt	13840-56-7	Reproductive toxicity - Article 57(c)	
214	2,2-bis(bromomethyl)propane-1,3-diol (BMP)	3296-90-0	Carcinogenicity - Article 57(a)	
214	2,2-Dimethylpropan-1-ol	36483-57-5	Carcinogenicity - Article 57(a)	
214	2,2-bis(bromomethyl)-1-propanol (TBNPA)	1522-92-5	Carcinogenicity - Article 57(a)	
214	2,3-dibromo-1-propanol (2,3-DBPA)	96-13-9	Carcinogenicity - Article 57(a)	
215	Glutaral	111-30-8	Endocrine disrupting, PBT or vPvB - Article 57(f)	
216	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]	-	PBT (- Article 57(d)) vPvB (- Article 57e)	
217	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)		Reproductive toxicity - Article 57(c) vPvB (- Article 57e)	
218	1,4-dioxane	123-91-1	Endocrine disrupting, PBT or vPvB - Article 57(f)	
219	4,4'-(1-methylpropylidene)bisphenol: (bisphenol B)	77-40-7	Endocrine disrupting, PBT or vPvB - Article 57(f)	
220	Contains any of the individual isomers of (±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one and/or combinations thereof (4-MBC)		Persistent, bioaccumulative (vPvB) Article 57(e)."	Cosmetics (anti-fading agent)
	(3E)-1,7,7-trimethyl-3-(4-methylbenzylidene) bicyclo[2.2.1]heptanone-2-one	1782069-81-1	Endocrine disrupting, PBT or vPvB Article 57(f)	Cosmetics (anti-fading agent)
	(1R, 3E, 4S)-1,7,7-trimethyl-3-(4-methylbenzylidene) bicyclo[2.2.1]heptanone-2-one	95342-41-9	Endocrine disrupting, PBT or vPvB Article 57(f)	Cosmetics (anti-fading agent)
	(1S, 3Z, 4R)-1,7,7-trimethyl-3-(4-methylbenzylidene) bicyclo[2.2.1]heptanone-2-one	852541-25-4	Endocrine disrupting, PBT or vPvB Article 57(f)	Cosmetics (anti-fading agent)

No	Chemical substances	CAS No.	Reason	Usage Example
	(±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptanone-2-one	36861-47-9	Endocrine disrupting, PBTo vPvB Article 57(f)	Cosmetics (anti-fading agent)
	(1R,4S)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptanone-2-one	741687-98-9	Endocrine disrupting, PBTo vPvB Article 57(f)	Cosmetics (anti-fading agent)
	(1S, 3E, 4R)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptanone-2-one	852541-30-1	Endocrine disrupting, PBTo vPvB Article 57(f)	Cosmetics (anti-fading agent)
	(1R,3Z,4S)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptanone-2-one	852541-21-0	Endocrine disrupting, PBTo vPvB Article 57(f)	Cosmetics (anti-fading agent)
221	6,6'-di-tert-butyl-2,2'-methylene-di-p-cresol (DBMC)	119-47-1	Endocrine disrupting, PBTo vPvB Article 57(f)	Rubber, lubricants, adhesives, inks, fuels (antioxidants, anti-aging agents)
222	S-(tricyclo[5.2.1.0 <sup>2,6</sup> ]deca-3-en-8(or 9)-yl) O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	255881-94-8	Endocrine disrupting, PBTo vPvB Article 57(f)	Lubricants, greases
223	Tris(2-methoxyethoxy)vinylsilane	1067-53-4	Endocrine disrupting, PBTo vPvB Article 57(f)	Rubber, plastics, encapsulants (silane coupling agents)
224	N-(hydroxymethyl)acrylamide	924-42-5	Reproductive toxicity ,Article 57 (c)	Textile leather modification and resin processing, synthetic resin coatings, adhesives, paper processing enhancers, soil conditioners
225	1,1'-[Ethane-1,2-diylbis(oxyl)bis[2,4,6-tribromobenzene]	37853-59-1	vPvB (Article 57e)	Flame Retardants for ABS
226	2,2',6,6'-tetrabromo-4,4'-isopropylidene diphenol	79-94-7	Carcinogenicity (Article 57a)	Flame retardants
227	4,4'-Sulfonyldiphenol	80-09-1	Reproductive toxicity (Article 57c)	Dyeing aid 225-agent, flame retardant, raw material for photographic couplers
228	Barium metaborate	13701-59-2	Reproductive toxicity (Article 57c)	Anti-mold agent, anti-corrosion paint, flame retardant
229	Bis(2-ethylhexyl) tetrabromophthalate (covering any of the individual isomers and/or combinations thereof)	26040-51-7	e) vPvB (extremely persistent and highly bioaccumulative substance)	Added as plasticizers to polyvinyl chloride products (sheets, leather, wire coating materials, films for agricultural vinyl, etc.)
230	Isobutyl 4-hydroxybenzoate	4247-02-3	Endocrine disrupting properties (Article 57(f) - Human health)	Antifungal agents and preservatives for cosmetics, pharmaceuticals, foods, etc.
231	Melamine (monomer)	108-78-1	Equivalent level of concern that may seriously affect human health (Article 57(f) - Human health) Equivalent level of concern that may have a serious effect on the environment (Article 57 (f) - Environment)	Melamine resin (POM), adhesives, pharmaceutical raw materials
232	Perfluoroheptanoic acid and its salts Ammonium perfluoroheptanoate Potassium perfluoroheptanoate Perfluoroheptanoic acid Sodium perfluoroheptanoate	- 6130-43-4 21049-36-5 375-85-9 20109-59-5	Reproductive toxicity (Article 57c) PBT (Article 57d) vPvB (Article 57e) Equivalent level of concern with potentially serious effects on human health (Article 57(f) - Human health)	
233	Reaction products of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine		Reproductive toxicity (Article 57c)	

## 2011/65/EU(RoHS) • 1907/2006/EC(REACH) 1907/2006/EC(REACH) Candidate substance

No	Chemical substances	CAS No.	Reason	Usage Example
1	Tetrabromobisphenol A (TBBP-A)	79-94-7	Acute toxicity, carcinogenicity, reproductive toxicity	Epoxy and polycarbonate resins, impact-resistant polystyrene and phenolic resins, adhesives
2	Medium Chain Chlorinated Paraffins (MCCP) C14-C17	-	Persistent, bioaccumulation	Plasticizers to increase flame retardancy of polyvinyl chloride (PVC) and rubber for cables, etc.

**Rank 4: Standards for substances that are prohibited from use in the manufacturing process of procured items (\*1)**

No.	Chemical substances	Primary legislation	Primary environmental effects	Primary applications
1	Ozone depleting substances (*2)	Ozone Layer Protection Law	Ozone depletion	Detergents and refrigerants
2	Organochlorine detergents (*3)	Soil Contamination Countermeasures Law	Soil contamination	Detergents

(\*1) Except being used only in a hermetically sealed state (e.g. cooling medium in chillers).

(\*2) The ozone-depleting substances prohibited from use in the manufacturing process are the specified substances listed in the middle column of the Table attached to Annex 1 of the Enforcement Order of the Law Concerning the Protection of the Ozone Layer Through the Control of Specified Substances and other Measures.

(\*3) Organochlorine detergents prohibited for use in manufacturing processes are as follows; carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethylene, 1,3-dichloropropene, dichloromethane, tetrachloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene,