

### CTO List of Hazardous Substances to be Avoided (LHSA)

This list contains a regularly reviewed selection of relevant hazardous substances  
Basis: ECHA candidate list of SVHCs<sup>1)</sup>, industry standards (electronics & automotive) and others

Status: January 2024

(major changes to previous version highlighted **yellow**)

**Note:**

1) Reporting threshold for suppliers corresponds to the value given in column "limit value (%wt)".  
2) Hazardous operating & auxiliary substances used in Schindler component manufacturing plants (KWs) and third party manufacturing plants are excluded from the scope of WI 0-09350-2 and this list.  
3) Depending on its specific application (or all applications), some substances or substance groups are also classified as prohibited hazardous substances (see EJ 41100161 "CTO List of Prohibited Hazardous Substances (LPHS)") in one end use, and as hazardous substance to be avoided (this list) in another end use.

**Disclaimer:** This list of prohibited hazardous substances is a selection of relevant substances for CTO and is not exhaustive.

Index	Substance / substance group	CAS No.	Typical application examples	Limit value % wt (weight percentage)	Reference of the limit value <sup>2)</sup>	Typically found in: * see footer
1	Arsenic and its compounds	7440-38-2	Alloy additives, metal adhesives, soft solders, glass, semiconductors, batteries, wood preservation	0.1	Application	1,2,3,5,7
2	Beryllium and its compounds	7440-41-7	Contact and spring materials, copper alloys, high-temperature materials, ceramics, glass, electrical components,	0.1	Application	1
3	Radioactive substances		Scrap metal contaminants (e.g., counterweight filling blocks), measuring devices, thorium in welding electrodes	any detectable contents	Application	1
4	Chromium trioxide - Acids generated from chromium trioxide and their oligomers. Group containing: - Chromic acid, - Dichromic acid, - Oligomers of chromic acid and dichromic acid	1333-82-0 7738-94-5 13530-68-2	Chromium pigments, chromium plating, e.g. "Chromium Yellow", corrosion inhibitors, residues from dyeing and leather tanning, cleaning products	0.1	Article (21/9/17) <sup>3</sup>	1,4
5	Strontium chromate	7789-06-2	Adhesives, sealants, paints, coatings, insulating materials	0.1	Article	1,3,4
6	Pentazinc chromate octahydroxide	49663-84-5	Adhesives, sealants, coating, insulating materials	0.1	Article	1,3,4
7	Cobalt(II) sulphate Cobalt(II) dinitrate Cobalt(II) carbonate Cobalt(II) diacetate	10124-43-3 10141-05-6 513-79-1 71-48-7	Metals, galvanic Zn-Co-plating, inorganic pigments and frits, glass, ceramics, varistors and magnets (calcination/sintering processes), batteries, inks, varnishes	0.1	Article	1,2,4
8	Calcium arsenate	7778-44-1	Metal finishes, electronics, paints, smelted materials, biocides (including wood treatment), leather and textile finishes, glass, pyrotechnic objects	0.1	Article	1,4,7
9	- Lead dipicrate - Trilead diarsenate - Lead diazide - Lead azide - Lead styphnate	6477-64-1 3687-31-8 13424-46-9 15245-44-0	Metals and alloys, stabilizers, pigments, corrosion inhibitors	0.1	Article	1,4

\*Typically Found In: 1: Electrical and electronic, metal alloys, glass/ceramic parts, brake/friction linings

2: Batteries, accumulators

3: Plastics and additives, rubber parts, insulating materials

4: Varnishes, coats, paints, lacquers, adhesives, resins, solvents, cleaning agents, lubricants, sealants

5: Wood, packaging

6: Coolants, tracers, insulating/pressure accumulating gases/liquids, fire extinguishing agents

7: Other applications

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10	Arsenic acid	7778-39-4	Metal and glass finishing agent, electronics, paints, smelted materials, biocides (including wood treatment), leather and textile finishes, glasses, pyrotechnic objects, dyes	0.1	Article	1,4,7
11	Dichromium tris(chromate)	24613-89-6	Metal surface treatments, steel and aluminium coatings	0.1	Article	1,4
12	Cobalt(II) dichloride	7646-79-9	Blue silica gel in desiccant bags (package insert), inorganic pigments & frits, glass, ceramic ware, varistors and magnets (calcination/sintering processes), electroplating	0.1	Article	1,4,5,7
13	Lead titanium zirconium oxide	12626-81-2	Ceramic capacitors, actuators	0.1	Article	1
14	Lead bis(tetrafluoroborate)	13814-96-5	Electroplating, metal finishing, curing agent for epoxy resins	0.1	Article	1
15	Lead titanium trioxide	12060-00-3	Ceramic capacitors, actuators, semiconductors, electronic and optical products, electrical equipment	0.1	Article	1
16	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	Flame-protected plastics in components and printed circuit boards	0.1	Article	1,3,6
17	Cadmium sulphide	1306-23-6	Semiconductors in photovoltaic cells, batteries, photoconductors, phosphors, photomultipliers, thin-film transistors, diodes and rectifiers, dye in plastics, paints, rubber, paper, glass, inks, ceramic glazes, adhesives, sealant, coatings	0.1	Article	1,2,3,4,7
18	Cadmium nitrate	EC CAS: 10022-68-1, 10325-94-7	Component for inorganic pigment production, additive for glass and ceramic production, batteries, fuel cells, PVC stabilizers		Article	1,2,3
19	Cadmium hydroxide	EC244-168-5 CAS 21041-95-2	Electro-galvanizing, electroplating, pyrometallurgy, pigments, batteries, fuel cells, PVC stabilizers		Article	1,2,3
20	Cadmium sulphate	EC 233-331-6 CAS: 10124-36-4, 31119-53-6	Electroplating of cadmium in electronic circuits, electrolyte in Weston standard cell, pigment in fluorescent screens, PVC stabilizers		Article	1,2,3
21	Cadmium fluoride	EC 232-222-0 CAS 7790-79-6	Metallic alloys, phosphorus for luminescent screens, glass manufacturing, electric brushes, high-temperature dry-film lubricants, optical applications, PVC stabilizers		Article	1,3,7
22	Cadmium chloride		Electroplating, printing, photocopying, dyeing, mirrors, vacuum tubes, lubricants, PVC stabilizers		Article	1,3,4,7
23	Lead	CAS 7439-92-1 EC: 231-100-4	Metal products, welding and soldering products (counterweight filling), batteries, ceramics	0.1	Article	1,2,7
24	2-methoxyethyl acetate	110-49-6	Adhesives, coatings, solvents	0.1	Article	4
25	Bis(2-methoxyethyl) ether	111-96-6	Electrolytes in lithium batteries, solvent in sealants, adhesives, plastics	0.1	Article	2,3,4
26	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	Electrolytes in lithium batteries, solvent in sealants	0.1	Article	2,3

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27	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	Electrolytes in lithium batteries, solvent in sealants and in fluxes	0.1	Article	2,4
28	1,2-Diethoxyethane	629-14-1	Electrolytes in lithium batteries, solvents, cleaning products	0.1	Article	2,4,7
29	Hexabromocyclododecane (HBCCD) including all major diastereoisomers: - Alpha-HBCCD - Beta-HBCCD - Gamma-HBCCD	25637-99-4 3194-55-6  (134237-50-6) (134237-51-7) (134237-52-8)	Flame-protected plastics, insulations, packaging material, electric and electronic equipment	0.1	Article (21/8/15) <sup>3)</sup>	1,3,5,6
30	Brominated flame retardants other than PBBs, PBDEs and HBCCD		Flame-protected plastics	0.1	Application	3,6
31	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (di[heptyl, nonyl, undecyl] phthalate, DHNUP)	68515-42-4	Plasticized plastics, particularly PVC	0.1	Article	3
32	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (diisooheptyl phthalate, DIHP)	71888-89-6	Plasticized plastics, particularly PVC	0.1	Article	3
33	Alkanes, C10-13, chloro (Short chain chlorinated paraffins)	85535-84-8	Metal working lubricants, fat liquoring of leather, flame retardant in textiles, rubber, paints, coatings, sealants, adhesives, plasticizers	0.1	Article	3,4,6,7
34	Tris(2-chloroethyl)phosphate (TCEP)	115-96-8	Plasticized and flame-protected plastics, flame-protected paints and varnishes, additive in flexible and rigid polyurethane and polyisocyanurate foam, unsaturated polyester resins, adhesives, elastomers, cellulose acetate, nitrocellulose, epoxy resins	0.1	Article (21/8/15) <sup>3)</sup>	3,4,6,7
35	4,4'- Diaminodiphenylmethane (MDA)	101-77-9	Vulcanizer for rubbers, hardener in epoxy resins. (e.g., Sika Biresin® U1303 Hardener (B)), adhesives, foams, insulating, dyes, materials, coatings, glues	0.1	Article (21/8/14) <sup>3)</sup>	3,4
36	Formaldehyde, oligomeric reaction products with aniline	25214-70-4	Hardener (e.g. Sika Biresin® U1303 Hardener (B)), adhesives, insulating materials, paints, foams, resins	0.1	Article	3,4,7
37	Bis(2-methoxyethyl) phthalate	117-82-8	Plasticizer, adhesives, solvent, coatings, packaging	0.1	Article	3,4,5
38	4-(1,1,3,3-tetramethylbutyl)pheno	140-66-9	Intermediate in resin production, non-ionic surfactants, rubber additives, fuel oil stabilizers, adhesives, dyestuffs, fungicides, bactericides, synthetic rubber vulcanization	0.1	Article	3,4,7
39	2,2'-dichloro-4,4'-methylenedianiline (MCA, MOCA, MBOCA)	101-14-4	Polyurethane products (wheels and pulleys for escalators and elevators), gears, gaskets, packaging, plastics, rubber, epoxy resins	0.1	Article	1,3,4,5,7
40	N,N-dimethylacetamide (DMAC)	127-19-5	Solvent, reagent, coatings, films, paints	0.1	Article	4
41	Acrylamide	76-06-1	Polyacrylamide, grouting agents (ban starting 5/11/12), coatings, paints	0.1	Article	4,7
42	Lead chromate	7758-97-6	Pigmented paints and varnishes, anti-corrosion coatings	0.1	Article(21/5/15) <sup>3)</sup>	4

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43	Lead chromate molybdate sulfate red (C.I. Pigment Red 104)	12656-85-8	Pigmented plastics and paints	0.1	Article (21/5/15) <sup>3)</sup>	3,4
44	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	Pigmented plastics and paints	0.1	Article (21/5/15) <sup>3)</sup>	3,4
45	Other lead compounds		Pigmented plastics and other materials, stabilized plastics (in particular PVC)	0.1	Homogenous material	3
46	Chromium (VI) compounds		Pigmented plastics and other materials, paints, inks, coatings, wood preservatives, metal finishing, chrome plating, leather tanning	0.1	Homogenous material	3,4,7
47	Potassium hydroxyoctaoxidizincatedichromate	11103-86-9	Chromium pigments, chromated surfaces e.g. "Chromium Yellow", corrosion inhibitors, residues from dyeing and leather tanning, coatings, adhesives, sealants	0.1	Article	4
48	Azo compounds		Pigmented plastics, textiles and leather articles, paints, varnishes	0.1	Application	3,4,7
49	Bis(tributyltin)oxide (Tributyltin oxide, TBTO)	56-35-9	Antifouling paints, fungicide, bactericide, textiles and leather articles, sealants, hard-surface disinfectants	0.1	Article	4,7
50	2-Ethoxyethyl acetate 2-Ethoxyethanol	111-15-9 110-80-5	Agent in polyester resins, PES-fibres, Polyvinylalcohol, Polyvinylpyrrolidone PES- and PU-enamels, synthetic resins, coatings, dyes	0.1	Article	3,4
51	Hydrazine	302-01-2 7803-57-8	Residual monomers in plastics, pigments and adhesives, oils, greases, natural latex, blowing agents for foamed plastics	0.1	Article	3,4
52	1-Methyl-2-pyrrolidone (NMP)	872-50-4	Solvent for electrode preparation, paint and coating removal, cleaning products	0.1	Article	2,4
53	1,2,3-Trichloropropane	96-18-4	Solvent, paint and varnish remover, degreasing agent, sealants	0.1	Article	4
54	Cadmium	7440-43-9	Surface protection of metals (electroplating), stabilizers in polymers, pigments, paints and plastics, electronics, batteries	0.1	Article	1,2,3,4
55	Cadmium oxide	1306-19-0	Power switching contacts and relays, photoelectric components, electroplating, batteries, ceramics, pigments	0.1	Article	1,2,4
56	Pentadecafluorooctanoic acid (PFOA)	335-67-1	Fluoropolymers such as PVDF and fluorinated rubbers, flame-retardant foams, wetting agents, cleaning products, paints, textiles, paper and cardboard, sealants, adhesives, greases, lubricants	0.1	Article	3,4,5,6,7
57	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	Fluoropolymers such as PVDF and fluorinated rubbers, textiles, sealants, floor wax	0.1	Article	3,7
58	Hexahydromethylphthalic anhydride Hexahydro-4-methylphthalic anhydride Hexahydro-1-methylphthalic anhydride Hexahydro-3-methylphthalic anhydride	25550-51-0 19438-60-9 48122-14-1 57110-29-9	Plastics, resins, rubbers, curing agent	0.1	Article	3,4

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59	Dipentyl phthalate (DPP)	131-18-0	Plasticized plastics, particularly PVC, coatings	0.1	Article	3,4
60	- Cyclohexane-1,2-dicarboxylic anhydride - cis-cyclohexane-1,2-dicarboxylic anhydride - trans-cyclohexane-1,2-dicarboxylic anhydride	85-42-7 13149-00-3 14166-21-3	Polymer additives, coatings, curing agent, adhesives, plasticizer, epoxy resin, sealants, paints	0.1	Article	3,4
61	Pyrochlore, antimony lead yellow	8012-00-8	Pigmented plastics and paints, coatings	0.1	Article	3,4
62	4-Aminoazobenzene (aniline yellow)	60-09-3	Dyed lacquers, varnishes, styrene resins	0.1	Article	4
63	Silicic acid, lead salt	11120-22-2	Stabilizer in rubbers and pigments, corrosion inhibitors, stone, cement, ceramics, glass	0.1	Article	1,3,4,7
64	Lead monoxide (lead oxide)	1317-36-8	Paints, lacquers and varnishes, blowing agents, vulcanizing agents in rubbers, corrosion inhibitors, coatings	0.1	Article	3,4
65	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	Polyurethane finishing, coatings, solvent, sealants	0.1	Article	4
66	Dibutyltin dichloride (DBTC)	683-18-1	Stabilized plastics (in particular PVC), lubricants, heat-transfer fluids	0.1	Article	3,4
67	Lead dinitrate	10099-74-8	Stabilized plastics (in particular polyamide and polyesters), textiles, dyes	0.1	Article	3,4,7
68	4-(1,1,3,3 tetramethylbutyl)phenol, ethoxylated	--	Paints, plastics, cleaning agents	0.1	Article	3,4
69	Lead oxide sulphate	12036-76-9	Stabilized plastics (in particular PVC)	0.1	Article	3
70	Tetralead trioxide sulphate	12202-17-4	PVC, plastics	0.1	Article	3
71	Acetic acid, lead salt, basic	51404-69-4	Coatings, paints, dyes, thinners, varnishes, paint removers, electronic and optical products, electrical equipment	0.1	Article	1,4
72	[Phthalato(2-)]dioxotrilead	69011-06-9	PVC, plastics, paints	0.1	Article	3,4
73	N-pentyl-isopentylphthalate	776297-69-9	PVC, plastics	0.1	Article	3
74	Pentalead tetraoxide sulphate	12065-90-6	PVC, plastics, batteries, heat stabilizers	0.1	Article	2,3
75	Dioxobis(stearato)trilead	12578-12-0	PVC, plastics	0.1	Article	3
76	Trilead dioxide phosphonate	12141-20-7	PVC, plastics, coatings, adhesives, sealants, rubber	0.1	Article	3,4
77	Diisopentylphthalate	605-50-5	PVC, plastics	0.1	Article	3
78	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	PVC, plastics, cleaning products, dyes	0.1	Article	3,4
79	Fatty acids, C16-18, lead salts	91031-62-8	PVC, plastics	0.1	Article	3
80	Orange lead (lead tetroxide)	1314-41-6	Pigmented anti-corrosion paints, coatings, plasters, clay	0.1	Article	4,7
81	Sulfurous acid, lead salt, dibasic	62229-08-7	Stabilized plastics (in particular PVC), friction additive, semiconductors	0.1	Article	1,3,7
82	Lead cyanamidate	20837-86-9	Pigmented anti-corrosion paints, coatings	0.1	Article	4
83	Lead(II) bis(methanesulfonate)	17570-76-2	Plasticizers, electro-plating, electronics, batteries	0.1	Article	1,2,3
84	4-Nonylphenol, branched and linear, ethoxylated		Coatings based on acrylic esters, paints based on polyvinyl acetates (PVA), lubricating oil additives, emulsifiers, solubilizers, epoxy formulation	0.1	Article	4,7
85	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	2451-62-9	Powder paints, semiconductor moulding resin, coatings	0.1	Article	4

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86	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC)	59653-74-6	Cross-linking additive for various polymers including powder coatings	0.1	Article	4
87	Dihexyl phthalate (DnHP)	84-75-3	PVC plastisol, plasticizer for cellulose ester and vinyl plastics, dip-moulded plastic products	0.1	Article	3
88	Imidazolidine-2-thione (2-imidazoline-2-thiol)	96-45-7	Rubbers, wires and cables, adhesives, sealants, o-rings, gaskets, electroplating, dyes, synthetic resins	0.1	Article	1,3,4
89	Lead di(acetate)	301-04-2	Rubber antioxidant, adhesives, coatings, paints and varnishes, chrome yellow pigments, gold cyanidation process	0.1	Article	4,7
90	Disodium 4-amino-3-[[4'-(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	Dyes (textiles, leather, paper), wood products	0.1	Article	4,5
91	Trixylyl phosphate	25155-23-1	Flame retardants, plasticizer, hydraulic fluids, lubricant, greases, varnishes	0.1	Article	3,4,6,7
92	Cadmium carbonate	EU 208-168-9 CAS 513-78-0	Glass, plastics, polymer-matrices, cable protecting and isolating coatings, moulded articles, catalysts	0.1	Article	1,3,4,7
93	Chrysene	EU 233-710-6 CAS: 218-01-9, 1719-03-5	Electrical parts, wood preservatives, dyes	0.1	Article	1,4,5
94	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.1.6,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"™) [covering any of its individual anti- and syn-isomers or any combination thereof]	EC 236-948-9 CAS: 13560-89-9 135821-74-8 135821-03-3	Flame retardants, adhesives, sealants, binding agents	0.1	Article	3,4,6,7
95	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP)[with greater than or equal to 0.1% w/w 4-heptylphenol, branched and linear (4-HPbl)]	No CAS number(s) provided	Lubricants, greases	0.1	Article	4
96	4,4'-isopropylidenediphenol (bisphenol A; BPA)	EC 201-245-8 CAS 80-05-7	Manufacture of polycarbonate, hardener for epoxy resins, antioxidant for processing PVC, thermal paper production, binder, curing agent, adhesives, fire retardants		Article	3,4,6,7
97	4-Heptylphenol, branched and linear	-	Detergents, lubricants, greases		Article	4,7
98	p-(1,1-dimethylpropyl) phenol	EC 201-280-9 CAS 80-46-6	Production of polymers (phenolic resins), adhesives, coatings, printing inks, paints		Article	4
99	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol	EC 223-383-8 CAS 3864-99-1	Ultraviolet absorber, manufacturing of polymers and organic substrates, plastics, solvents, preservatives		Article	3,4,7
100	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol	EC 253-037-1 CAS 36437-37-3	Ultraviolet absorber, manufacturing of polymers and organic substrates, plastics		Article	3,7

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101	Nitrobenzene	EC 202-716-0 CAS 98-95-3	Varnishes, lubricants, dyes, synthetic rubber		Article	3,4
102	Perfluorononan-1-oi-c-acid and its sodium and ammonium salts	CAS: 4149-60-4 375-95-1 21049-39-8	Lubricants, surfactant for fire extinguishers, cleaning agents, textile finishing agents, polishing surfactants, liquid crystal display panels, emulsifying/foaming agent		Article	4,6,7
103	- 1,2-benzenedicarboxylic acid - di-C6-10-alkyl esters - mixed decyl and hexyl and octyl diesters	EC: 272-013-1 CAS: 68648-93-1 EC: 271-094-0 CAS: 68515-51-5	Manufacture of PVC compounds, coatings, building material, lubricants, adhesives, sealants		Article	3,4,7
104	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol	EC 247-384-8 CAS 25973-55-1	Coatings, adhesive UV stabilizer		Article	4,7
105	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	EC 223-346-6 CAS 3846-71-7	UV absorber, coatings, plastics		Article	3,4,7
106	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	EC 239-622-4 CAS 15571-58-1	Plastics		Article	3
107	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	-	Plastics		Article	3
108	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	EC 271-093-5 CAS 68515-50-4	Lubricants, plasticizer		Article	3,4
109	Decamethylcyclotrasiloxane	CAS 541-02-6 EC 208-764-9	Polishes, waxes, paints, coatings, adhesives			4
110	Dicyclohexyl phthalate	CAS 84-61-7 EC 201-545-9	Plasticizer, adhesives, sealants, coatings, fillers, putties, plasters, non-metal-surface treatment products, polishes, waxes, polymers and textile treatment products, dyes			3,4,7
111	Disodium octaborate	CAS 12008-41-2; 12280-03-4 EC 234-541-0	Coatings, paints, adhesives, lubricants, greases, heat transfer fluids, cleaning products, metals, inks, toners (substance approved for use as a biocide in the EEA and/or Switzerland for wood preservation)			1,4,5
112	Dodecamethylcyclohexasiloxane	CAS 540-97-6 EC 208-762-8	Polishes, waxes, solvents, cleaning products, lubricants, cleaning products, sealants, adhesives, waxes, coatings			4,7
113	Ethylenediamine	CAS 107-15-3 EC 203-468-6	Adhesives, sealants, coatings, fillers, putties, plasters, modelling clay, lubricants, resins			3,4,7
114	Octamethylcyclotetrasiloxane	CAS 556-67-2 EC 209-136-7	Polishes, waxes, paints, coatings, adhesives, sealants			3,4
115	Terphenyl, hydrogenated	CAS 61788-32-7 EC 262-967-7	Adhesives, sealants, coatings, fillers, putties, plasters, modelling clay and polymers, plastic products for packaging			3,4,5
116	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	335-76-2 3830-45-3 3108-42-7	Wetting agent, flame retardants	0.1	Article	4,6,7

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2: Batteries, accumulators

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4: Varnishes, coats, paints, lacquers, adhesives, resins, solvents, cleaning agents, lubricants, sealants

5: Wood, packaging

6: Coolants, tracers, insulating/pressure accumulating gases/liquids, fire extinguishing agents

7: Other applications

Index	Substance / substance group	CAS No.	Typical application examples	Limit value % wt (weight percentage)	Reference of the limit value <sup>2)</sup>	Typically found in: see footer
117	Benzo[k]fluoranthene	207-08-9	Adhesives, transmission fluids, brake fluids	0.1	Article	4,7
118	Fluoranthene	206-44-0	Surface treatments for metals, hardening agents, corrosion inhibitors, polishing agents, rust inhibitors, water repellents, adhesives, sealants, electronics	0.1	Article	1,4,7
119	Pyrene	129-00-0	Surface treatments for metals, plastics, hardening agents, corrosion inhibitors, polishing agents, rust inhibitors, water repellents, epoxy resins, adhesives, sealants, dyes	0.1	Article	1,3,4,7
120	4-tert-butylphenol	98-54-4	Adhesives, sealants, coatings, varnishes, cleaning products, plasticizer	0.1	Article	3,4
121	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP)	3050-88-2 26523-78-4	Plastics	0.1	Article	3
122	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	Adhesives, lubricants, plastics	0.1	Article	3,4
123	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	Coatings, plastics, fabricated metal products	0.1	Article	3,4
124	Diisohexyl phthalate (DIHP)	71850-09-4	Lubricant, plasticizer	0.1	Article	3,4
125	Perfluorobutane sulfonic acid (PFBS) and its salts		Stain and water repellent, cleaning agents, paints	0.1	Article	4,7
126	2-methylimidazole	693-98-1	Coatings, dyes, pigments, rubber epoxy resin	0.1	Article	3,4
127	Tin, dibutylbis(2,4-pentanedionato- $\kappa$ .O2, $\kappa$ .O4)-, (OC-6-11)-	22673-19-4	Adhesives, sealants	0.1	Article	4
128	bis(2-(2-methoxyethoxy)ethyl)ether; tetraglyme	143-24-8	Lubricants, greases, solvents	0.1	Article	4
129	- Dioctyltin dilaurate, stannane - dioctyl-, bis(coco acyloxy) derivs., - any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety	91648-39-4 3648-18-8	Plastics, rubber	0.1	Article	3
130	Refractory Ceramic Fibres, Aluminosilicate	index number 650-017-00-8 in Annex VI, part 3, tables 3.1 and 3.2 of CLP Regulation (EC) No 1272/2008	Electrical, thermal, and sound insulating materials	0.1	Article	3
131	Refractory Ceramic Fibres, Zirconia Aluminosilicate					3
132	Chlorinated hydrocarbons		Solvents, cleaning and degreasing agents	0.1	Application	4,7
133	Other chlorinated paraffins		Lubricants, flame retardant plasticizers, flame retardants	0.1	Application	4,6,7
134	Dimethylformamide (DMF)	68-12-2	Electrolyte capacitors, plastics, solvent, manufacture of adhesives, films, surface coatings	0.1	Application	3,4,7
135	Anthracene Anthracene oil Anthracene oil, anthracene paste Anthracene oil, anthracene paste, anthracene fraction Anthracene oil, anthracene paste, distn. lights Anthracene oil, anthracene-low	120-12-7 90640-80-5 90640-81-6 91995-15-2 91995-17-4 91995-82-7	Paints, coatings, dyes	0.1	Article	4

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136	2,4-Dinitrotoluene (DNT)	121-14-2	Plasticizer, coatings	0.1	Article (21/8/15) <sup>3)</sup>	3,4
137	Ammonium dichromate	7789-09-5	Wood preservatives, lithography, mordant	0.1	Article (21/9/15) <sup>3)</sup>	5,7
138	Boric acid	10043-35-3	Lubricants, wood preservatives, LCD flat panels, flame retardants in wood, paper, cotton, and other plant-derived materials	0.1	Article	4,5,6,7
139	Diarsenic pentaoxide (arsenic pentoxide)	1303-28-2	Metallurgy (copper, lead, gold hardener), special glasses, metal adhesives, wood preservative	0.1	Article (21/5/15) <sup>3)</sup>	1,5,7
140	Diarsenic trioxide (arsenic trioxide)	1327-53-3	Decolorizing agent for glass and enamels, glass and lead glass, wood preservation	0.1	Article (21/5/15) <sup>3)</sup>	1,5,7
141	Disodium tetraborate, anhydrous (Borax)	1330-43-4	Steel and iron welding flux, flame retardant in wood, paper, cotton and other plant-derived materials	0.1	Article	1,5,6,7
142	Pitch, coal tar, high temp.	65996-93-2	Wood preservative, coatings, paints, adhesives, sealants, metallurgic smelting, refractory products	0.1	Article	1,4,5,7
143	Potassium chromate	7789-00-6	Enamels, paints, dyes, inks	0.1	Article (21/9/17) <sup>3)</sup>	4,7
144	Potassium dichromate	7778-50-9	Wood treatment, cement additives, cleaning agents	0.1	Article (21/9/17) <sup>3)</sup>	4,5,7
145	Sodium chromate	7775-11-3	Wood preservatives, corrosion inhibitor, inks, paints, paint removers	0.1	Article (21/9/17) <sup>3)</sup>	4,5,7
146	Sodium dichromate	7789-12-0 10588-01-9	Metal surface treatment (corrosion inhibitor), wood impregnation, anti-corrosion pigments, ceramics, textiles	0.1	Article (21/9/17) <sup>3)</sup>	1,4,5,7
147	Tetraboron disodium heptaoxide, hydrate	12267-73-1	Detergents and cleaners, glass and glass fibres, ceramics, industrial fluids, metallurgy, adhesives, flame retardants	0.1	Article	1,4,6,7
148	Trichloroethylene	79-01-6	Cleaning agents, solvent	0.1	Article (21/4/16) <sup>3)</sup>	4,7
149	Triethyl arsenate	15606-95-8	Wood preservatives (phased out), glass, plastics	0.1	Article	1,3,7
150	Lead hydrogen arsenate	7784-40-9	Wood preservation (phased out), glass, electronic and electrical products, plastics	0.1	Article	1,3,5,7
151	Trilead bis(carbonate)dihydroxide	1319-46-6	Polyethylene wire insulation, greases, plastics, cements, paints, semiconductors	0.1	Article	1,3,4,7
152	1-bromopropane (n-propyl bromide)	106-94-5	Metal surface cleaning products, adhesives, coatings, solvent	0.1	Article	4,7
153	Perfluorohexane-1-sulfonic acid and its salts (PFHxS)	Not yet registered under REACH	Plasticizer, lubricants, surfactants, wetting agents, corrosion inhibitor, fire-retardant foams		Article	3,4,6,7
154	Diboron trioxide	1303-86-2	Flame retardant in wood, paper, cotton and other plant-derived materials, paints, textiles, dyes, adhesives, sealants	0.1	Article	4,5,6,7
155	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Blue 26) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	2580-56-5	Dye used in inks, paints and pigments used for packaging and labels	0.1	Article	5
156	1,4-dioxane	123-91-1	Solvent, wetting/dispersing agent	0.1	Article	4,7
157	2,2-bis(bromomethyl)propane-1,3-diol (BMP); 2,2-	1522-92-5 3296-90-0	Flame retardants for foams, plastics	0.1	Article	3,6,7

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7: Other applications

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	dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA); 2,3-dibromo-1-propanol (2,3-DBPA)	96-13-9 36483-57-5				
158	4,4'-(1-methylpropylidene)bisphenol	77-40-7	Manufacture of phenolic and polycarbonate resins	0.1	Article	4
159	Phenol, alkylation products (mainly in para position) with C12-rich branched alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP) - Phenol, 4-dodecyl, branched - 4-isododecylphenol - Phenol, 4-isododecyl- - Phenol, dodecyl-, branched - Phenol, (tetrapropenyl) derivatives - Phenol, tetrapropylene-	121158-58-5 74499-35-7 57427-55-1 210555-94-5 27459-10-5 27147-75-7	Lubricants, paints, coatings, cleaning products, dyes, pigments	0.1	Article	4,7
160	Medium-chain chlorinated paraffins (MCCP) - Alkanes, C14-17, chloro - Tetradecane, chloro derivs. - Alkanes, C14-16, chloro - di-, tri- and tetrachlorotetradecane	85535-85-9 198840-65-2 1372804-76-6	Adsorbents, lubricants, greases, paints, coatings, softening agents in PVC	0.1	Article	3,4
161	Orthoboric acid, sodium salt - Boric acid (H3BO3), sodium salt (1:1) - Boric acid (H3BO3), disodium salt - Boric acid, sodium salt - Orthoboric acid, sodium salt - Trisodium orthoborate - Boric acid (H3BO3), sodium salt, hydrate	14890-53-0 22454-04-2 1333-73-9 13840-56-7 14312-40-4 25747-83-5	Lubricants, adhesives, sealants	0.1	Article	4
162	6,6'-di-tert-butyl-2,2'-methylene-di-p-cresol	119-47-1	Plastics, rubbers, latex, adhesives, electronics, inks	0.1	Article	1,3,4
163	tris(2-methoxyethoxy)vinylsilane	1067-53-4	Sealants, plating agents, surface treatments, plastics, rubbers	0.1	Article	3,4
164	S-(tricyclo(5.2.1.02,6)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	Lubricants, greases	0.1	Article	4
165	N-(hydroxymethyl)acrylamide	924-42-5	Surface coatings, varnishes, films, sizing agents, adhesives, binders	0.1	Article	3,4
166	1,1'-[ethane-1,2-diylbis(oxy)]bis[2,4,6-tribromobenzene]	37853-59-1	ABS resins, flame retardant	0.1	Article	3,4,6
167	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	79-94-7	Flame retardant, resins, epoxy coated circuit boards, printed circuit boards, paper, textiles	0.1	Article	1,3,4,5,6,7
168	Barium diboron tetraoxide	13701-59-2	Paints, coatings	0.1	Article	4
169	Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	-	Flame retardant, plasticizer, coated fabrics, wall coverings, adhesives	0.1	Article	3,4,6
170	Isobutyl 4-hydroxybenzoate	4247-02-3	Coating products, fillers, plasters, inks, toners	0.1	Article	4,7
171	Melamine	108-78-1	Resins, coatings, adhesives, sealants	0.1	Article	4
172	Bis(4-chlorophenyl) sulphone	80-07-9	Epoxy resin	0.1	Article	4

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173	Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	Coatings	0.1	Article	4
174	2,4,6-tri-tert-butylphenol	732-26-3	Lubricants, thermoplastics	0.1	Article	3,4
175	2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol (UV-329)	3147-75-9	Molded items, glazing	0.1	Article	3,4
176	2-(dimethylamino)-2-[(4-methylphenyl)methyl]-1-[4-(morpholin-4-yl)phenyl]butan-1-one	119344-86-4	Inks, toners, coatings	0.1	Article	4
177	Bumetrizole (UV-326)	3896-11-5	Coatings, sealants, adhesives	0.1	Article	4
178	Phenol, methylstyrenated	68512-30-1	Plastics, rubber	0.1	Article	3

Other hazardous substances to be avoided (potentially) relevant to the elevator industry (limit value 0.1% wt homogenous material)			
	Substances	Reason for avoidance	Typical applications
179	Gussolith	Carcinogenic air emissions during recycling in steel mill	Counterweight fillings
180	Lead	Hampers recycling of scrap iron. Release of toxic vapours during melting process.	Counterweight fillings
181	Bitumen or asphalt	Fumes from production/disposal potentially carcinogenic	Anti-drum materials
182	Cobalt, cobalt compounds and alloys	Hazard through dust, aerosols and fumes	Hard metals, galvanic Zn-Co-plating, permanent magnets
183	Sodium nitrite	Nitrite can form cancerogenic nitrosamines if amines are present	Anti-rust agent
184	Diphenylamine	Environmentally hazardous, toxic	Lubricants
185	Polychlorinated biphenyls (PCBs)	Persisten, bioaccumulative and toxic (PBT)	Lubricants
186	Polycyclic aromatic hydrocarbons (PAH)	German tested safety (GS - Geprüfte Sicherheit) Application	0.005% in potting material in electronic or magnetic ballast for lamps
187	Chlorocresol (meta- and ortho-)	Environmentally hazardous, allergy	Biocide in lubricants
188	2,4-Toluene diisocyanate 2,6-Toluene diisocyanate	Allergy (asthma)	PUR foams, adhesives
189	Colophony (rosin) applies to > 1%	Allergy	Adhesives, paints, cutting fluids
190	DHTDMAC, DSDMAC, DTDMAC	Environmentally hazardous	Cleaning agents
191	Polyvinyl chloride (PVC)	Hazardous to health and corrosive to building in case of fire	Insulation of cables and wires (travelling cables, hoistway wiring, machine wiring)
192	Polytetrafluoroethylene (PTFE, Teflon)	Hazardous to health and corrosive to building in case of fire	Sliding parts, lubricants

**Notes:**

<sup>1)</sup> Candidate list of substances of very high concern (SVHC) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

<sup>2)</sup> Reference of the limit value:

- ξ "Application" means that the limit value of the substance refers to the material or part where this substance is contained to achieve an intended functionality, as exemplarily given by the typical applications.
- ξ "Article" means that the limit value refers to the supplied article (device, component or product part) as a whole.
- ξ "Homogeneous material" is defined as material that cannot be mechanically disjointed into different materials. The term "homogeneous" means "of uniform composition throughout". Examples of homogeneous materials are individual types of plastics, ceramics, glass, metals, alloys, resins and coatings.

<sup>3)</sup> "Sunset date" after which substance (group) will be banned, unless application for use is authorized by ECHA referring to Annex XIV of REACH Regulation (EC) No 1907/2006

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  - 6: Coolants, tracers, insulating/pressure accumulating gases/liquids, fire extinguishing agents
  - 7: Other applications