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1 PURPOSE

The purposes of this Technical Standard are as follows:

- ✧ To clarify the banned substances included in the parts and devices constituting Delta products, or substances used for Delta products.
- ✧ To thoroughly notify the above-mentioned matters to both the whole Delta and parts/ devices suppliers.
- ✧ To improve the environmental quality of the products.

2 SCOPE

This Technical Standard applies to the following parts/ devices constituting Delta products: electrical parts, mechanical parts, semiconductor devices, printed wiring boards (PWBs), and packaging materials/ packaging parts.

- ✧ Including assemblies such as functional units, modules, and board assemblies.
- ✧ Including attachments such as the accessories procured as parts.
- ✧ Including composing materials such as the subsidiary parts and materials managed by parts specifications.
- ✧ Including the substances used in the production processes of parts.

This Management Standard will be entered into enforcement 30 days after being published officially, unless elsewhere be stated its enforced date.

3 DEFINITIONS OF TERMS

- ✧ Homogeneous materials:
  Homogeneous materials are defined as materials that cannot be mechanically disjointed into different materials and are "of uniform composition throughout." Examples are plastics, laminates, alloys, molding compounds, finishes, ceramics, plating materials, etc. that are presented in the finished parts and products.

- ✧ Contained:
  "Contained" means that a substance remains in parts, devices, or their materials because of addition, filling, blending, or adhesion, whether intended or not. When a substance is unintentionally contained in, or added to a product in a processing process, this situation is also regarded as "Contained." Dopants (Doping Agents) for production of semiconductor devices, etc. are not treated as "Intentionally added" if present in the devices in a very small amount.

- Intentionally added:
  "Intentionally added" means a situation where a substance is contained in the parts, devices, or their materials because of deliberate addition, filling, blending, or adhesion, in order to provide a specific characteristic, appearance, property, attribute or equality. (One contained in a natural material, which cannot be completely removed by in a refining process by adequate technical means (i.e. natural impurities); and one generated in a synthesis process, which cannot be completely removed by adequate technical means.)

- Banned substances:
  Among the substances included in the parts and devices (refer to the SCOPE) or the ones used at the time of manufacturing, banned substances are those hazardous substances that are not allowed to be added intentionally and to be contaminated accidentally. The threshold limits of those banned substances are specified in any applicable test methods that are regulated in any related regulations and laws.

- MDL: Method Detection Limit.

- N.D.: Not detected/ not detectable.

- PPM, ppm: Parts per million, unit of measurement for weight percentage.

- Threshold limit:

  The maximum concentration threshold of the regulated environment-related substance is allowed to be contained in homogenous level of the parts or materials constituting to Delta products due to technically irremovability of the regulated substance.

- Packaging:

  Materials used to protect products from damage due to storage or transportation (e.g., boxes, shipping supplies, cushioning & foam, bags, shrink wrap, tape/ adhesives), including inks and dyes used to label packages. Reusable or returnable packaging under the control of traders or suppliers is out of this scope.

- Mechanical Plastic Part:

  Plastic parts that do not internally carry an electrical signal such as housings, brackets, bezels, latches, etc. that form the basic structure of the product and/ or have mechanical functions.

4 MANAGEMENT STANDARDS FOR ENVIRONMENT-RELATED SUBSTANCES

4-1 Delta mandatory banned substances

The following restrictions are applicable to all parts, components, materials that are in scopes, except for the listed exemptions.

Table 4-1 List of Delta banned substances

Banned substances	CAS No.	Scope	Threshold Limit	Exemptions	References
Cadmium and cadmium compounds	-	-Plastics, rubbers, paints and inks	N.D.	EU RoHS exemptions	Directive 2011/65/EU Directive (EU) 2018/736 Directive (EU) 2018/737 Directive (EU) 2018/738 Directive (EU) 2018/739 Directive (EU) 2018/740 Directive (EU) 2018/741 Directive (EU) 2018/742
		-Solders	20 ppm		
		-Other homogeneous materials	50 ppm		
Lead and lead compounds	-	-Plastics, rubbers, paints and inks	50 ppm	EU RoHS exemptions	
		-Other homogeneous materials	800 ppm		
Mercury and mercury compounds	-	All parts	N.D.	EU RoHS exemptions	
Hexavalent chromium compounds	-	-Metallic parts	N.D.	EU RoHS exemptions	
		-Other homogeneous materials	100 ppm		
Sum of cadmium/lead/ mercury/ hexavalent chromium compounds	-	Package material	100 ppm		Directive 94/62/EC
Polybrominated biphenyls (PBBs)	See Table 2	All parts	100 ppm		Directive 2011/65/EU
Polybrominated diphenyl ethers (PBDEs)	See Table 3	All parts	100 ppm		Directive 2011/65/EU
Bis (2-ethylhexyl)phthalate(DEHP) Dioctyl phthalate(DOP)	117-81-7	All parts	1000 ppm		Directive(EU) 2015/863
Benzylbutyl Phthalate(BBP)	85-68-7	All parts	1000 ppm		Directive (EU) 2015/863
Dibutyl Phthalate (DBP)	84-74-2	All parts	1000 ppm		Directive (EU) 2015/863
Di-iso-butyl Phthalate (DIBP)	84-69-5	All parts	1000 ppm		Directive (EU) 2015/863

Banned substances	CAS No.	Scope	Threshold Limit	Exemptions	References
Antimony	7440-36-0	Halogen-free part See 10000-2003	1000 ppm as antimony	- Antimony trioxide used as flame retardant. - Additives in for ceramic or glass in components. - Solder.	Delta policy
Antimony trioxide	1309-64-4				
Arsenic	7440-38-2	-Solder and metal alloy	300 ppm	Arsenic and its compounds used for semiconductors, magnet filters and battery cells.	Delta policy
		-Packaging material (include woods)	50 ppm		
		-Other homogeneous materials	50 ppm		
Asbestos	-	All parts	Not used		EU REACH Annex XVII
Bisphenol A	80-05-7	External plastics parts	1000 ppm		EU REACH Annex XVII Proposition 65
Benzenamine, N-phenyl-, Reaction Products with Styrene and 2,4,4-Trimethylpentene (BNST)	68921-45-9	All parts	Not used, not intentionally added		Prohibition of Certain Toxic Substances Regulations, 2012
Benzidine-Based Dyes	See Table 4	All parts	Not used		U.S. TSCA EU REACH Annex XVII
Beryllium	7440-41-7	All parts	1000 ppm	Beryllium-copper alloy used for electrical contacts	Delta policy
Beryllium oxide	1304-56-9	All parts	100 ppm	Ceramics in components	Delta policy
Brominated Flame Retardants	Various	-All enclosed plastic for adaptors -Halogen-free parts. See 10000-2003	Not used	Wall mount adaptors models	Delta policy
Chlorinated flame retardant	Various	All parts	Not used		Delta policy
Chlorinated paraffin (Short-chain) ($C_{10\sim13}$, Cl≧50 wt%) (SCCPs)	Various	All parts	Not used		EU REACH Annex XVII; Stockholm Convention
Chlorinated paraffin (Medium-chain) ($C_{14\sim17}$, Cl≧50 wt%) (MCCPs)	Various	All parts	Not used		Delta policy
Cobalt dichloride	7646-79-9 7791-13-1	Package material (Desiccant)	Not used		EU REACH Annex XVII

Banned substances	CAS No.	Scope	Threshold Limit	Exemptions	References
Diarsenic trioxide	1327-53-3	All parts	1000ppm		EU REACH Annex XIV
Diarsenic pentaoxide	1303-28-2	All parts	1000ppm		EU REACH Annex XIV
Dibutyltin (DBT) compounds	See Table 5	All parts	1000 ppm as tin		EU REACH Annex XVII
Bis(2-propylheptyl) phthalate (DPHP)	53306-54-0	All parts	1000 ppm		Delta policy
Bis(2-methoxyethyl) phthalate	117-82-8	All parts	1000 ppm		EU REACH Annex XIV
Dicyclohexyl Phthalate (DCHP)	84-61-7	All parts	1000 ppm		Delta policy
Diethyl phthalate (DEP)	84-66-2	All parts	1000 ppm		Delta policy
Diisodecyl Phthalate (DIDP)	26761-40-0 68515-49-1	All parts	1000 ppm		EU REACH Annex XVII
Diisononyl Phthalate (DINP)	28553-12-0 68518-48-0	All parts	1000 ppm		EU REACH Annex XVII
Diisooctyl Phthalate(DIOP)	27554-26-3	All parts	1000 ppm		Delta policy
Diisopentyl phthalate (DIPP)	605-50-5	All parts	1000 ppm		EU REACH Annex XIV
Dimethyl Phthalate (DMP)	131-11-3	All parts	1000 ppm		Delta policy
Di-n-0ctyl Phthalate (DnOP)	117-84-0	All parts	1000 ppm		EU REACH Annex XVII
Dinheptyl Phthalate	3648-21-3	All parts	1000 ppm		Delta policy
Di-n-hexyl phthalate (DnHP)	84-75-3	All parts	1000 ppm		Delta policy
Dinonyl Phthalate (DNP)	84-76-4	All parts	1000 ppm		Delta policy
Dipentyl phthalate (DPP)	131-18-0	All parts	1000 ppm		EU REACH Annex XIV
Diphenyl Phthalate	84-62-8	All parts	1000 ppm		Delta policy
Di-propyl Phthalate	131-16-8	All parts	1000 ppm		Delta policy
DEHP+DBP +BBP	-	Toys	500 ppm		Directive 2005/84/EC
DINP+DIDP+DnOP	-	Toys	500 ppm		Directive 2005/84/EC
Dimethylfumarate (DMF)	624-49-7	All parts	0.1 ppm		EU 2009/251/EC; EU REACH Annex XVII
Formaldehyde	50-00-0	Plywood board	0.05 ppm		Delta policy
		Wood shaving block	0.5 ppm		

Banned substances	CAS No.	Scope	Threshold Limit	Exemptions	References
Monomethyldibromodiphenyl-methane (DBBT)	99688-47-8	All parts	Not used		EU REACH Annex XVII
Musk Xylene	81-15-2	All parts	Not used		EU REACH Annex XIV
Musk Ketone	81-14-1	All parts	Not used		Delta policy
Musk lactone	3391-83-1	All parts	Not used		Delta policy
Nickel and its compounds	-	External chassis/ case and parts frequently handled by the user.	0.5μg/cm^2/week	-Nickel in stainless steel. -Parts do not contact human skin.	EU REACH Annex XVII
Natural rubber or natural latex	-	External mechanical parts	Not used		Delta policy
Perchlorate	14797-73-0	All parts	0.006 ppm		JIG-101
Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonic acid (PFOS) compounds	See Table 6	All parts	25 ppb		EU REACH Annex XVII
Polychlorinated terphenyls (PCTs)	-	All parts	Not used		EU REACH Annex XVII
Polycyclic Aromatic Hydrocarbons (PAHs)	See Table 7	Plastic and rubber material used for external mechanical parts	1 ppm (Sum of 15 PAHs)	Parts that do not contact human skins continuously.	EU REACH Annex XVII
Polyvinyl chloride (PVC) and PVC blends	9002-86-2 & Various	All parts	Not used	- Wire and cable assembles. - Plastic parts less than 25 grams.	Delta policy
Persistent Organic Pollutants (POPs)	See Table 6	All parts	Not used		Stockholm Convention EU Regulation 850/2004
Radioactive materials	-	All parts	Not above background levels		Delta policy
Red phosphorous	7723-14-0	Used as plastic flame retardants	Not used		Delta policy
Specific benzotriazole: UV-320 UV-327 UV-328 UV-350	3846-71-7 3864-99-1 25973-55-1 36437-37-3	All parts	Not used		Japan CSCL EU REACH Annex XVII

Banned substances	CAS No.	Scope	Threshold Limit	Exemptions	References
Substances depleting the ozone layer (ODS)	See Table 8	All parts and manufacturing process material	Not used		Annexes A, B, C, E of Montreal Protocol
Selenium and its compounds	Various	All parts	Not used		Delta policy
Specific azo dyes	See Table 4	All parts	Not present		EU REACH Annex XVII
Tetrabromobisphenol A (TBBPA)	79-94-7	All parts	Not used	Used as reactive flame retardant.	Delta policy
Tributyltin oxide (TBTO)	56-35-9	All parts	Not used		EU REACH Annex XVII
Triphenyltin compounds (TPT)	See Table 5	All parts	Not used		EU REACH Annex XVII
Tris(2-chloroethyl) phosphate (TCEP)	115-96-8	Used as plastic flame retardants	Not used		EU REACH Annex XIV
Trixylenyl phosphate (TXP)	25155-23-1	Used as plastic flame retardants	Not used		Delta policy
Tris(2,3-dibromopropyl) phosphate (TDBPP)	126-72-7	Used as plastic flame retardants	Not used		Delta policy
Tri-1-aziridinylphosphine oxide (TEPA)	545-55-1	Used as plastic flame retardants	Not used		Delta policy
Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)	13674-87-8	Used as plastic flame retardants	Not used		Delta policy
Triphenyl phosphate (TPP)	115-86-6	Used as plastic flame retardants	Not used		Delta policy
Tris (1-chloro-2-propyl) phosphate (TCPP)	13674-84-5	Used as plastic flame retardants	Not used		Delta policy
Triethyl arsenate	15606-95-8	All parts	Not used		EU REACH Annex XVII
2,4,6-Tris(tert-butyl)phenol	732-26-3	All parts	Not used		Delta policy
Ugilec 121	81161-70-8	All parts	Not used		EU REACH Annex XVII
Ugilec 141	76253-60-6	All parts	Not used		EU REACH Annex XVII

4-2 Restrictions for batteries

Restrictions on Content of Batteries Used in Products		
Targets		Implement date
Cadmium	- Batteries and battery packs whose cadmium content, in proportion to each unit weight, is 0.002% or more. Exemptions: (a) emergency and alarm systems, including emergency lighting (b) medical equipment	Banned immediately
Lead	-All batteries whose lead content, in proportion to their weight, is 0.004% or more.	Banned immediately
Mercury	- All battery types whose mercury content, in proportion to their weight, is 0.0005% or more.	Banned immediately

4-3 Chemical substances information –REACH requirement

Based on REACH (Registration, Evaluation, Authorization and restriction of Chemicals EC 1907/2006), suppliers must have communication of information about substances identified by the European Chemical Agency (ECHA) known as the list of Substance of Very High Concern (SVHC). Suppliers must disclosure detail information for SVHC in delivered products.

REACH Article 67 stated that a substance on its own, in a preparation or in an article, for which Annex XVII contains a restriction, shall not be manufactured, placed on the market or used.

All material delivered to Delta were not allow contain Annex XVII substances, furthermore, if suppliers delivered parts to Delta contain any SVHC that is over the report threshold of 1000 ppm (substance weight/ article weight) in weight. There are several required information for communication: a) substance name, b) CAS number, c) weight of substance, and d) concentration and applications of substance.

Please visit the website for the latest information about REACH regulated substances.

SVHC << https://echa.europa.eu/candidate-list-table>>

REACH Annex XVII << https://echa.europa.eu/substances-restricted-under-reach>>

5 Other design requirements

- Avoided Gluing or soldering of different material.
- Plastic materials in covers / housing had better not be surface coated.
- All the thermoplastic parts≧25g or ≧200 mm^2 and packaging material, have to be marked in accordance to ISO 11469, and ISO 1043 -1, -2, -3, -4.

6 Requirements for Test Report

6-1 Items to be stated in Reports

(1). Pre-treatment method

Please be sure to indicate for all pre-treatment the fact that the sample had been totally digested and dissolved by entering "Totally dissolved." If this entry is not clear, Delta will ask you to submit the new report. Delta will not accept any "in-house" pre-treatment.

(2). Test method.

(3). Name of analysis institution and corresponding signature.

The tests must be done by 3rd party labs and have its own test lab with ISO 17025 certification. When customers have requirements for reports tested by specific test laboratories, Delta will ask you to resubmit the report again if the report was tested by other laboratories.

(4). Test date

(5). Test result (must state the detection limit)

(6). Test flowchart

(7). Photographs of the samples

(8). Accepted test methods

Banned substances	Test methods
Cadmium and cadmium compounds	IEC 62321
Lead and lead compounds	IEC 62321
Mercury and mercury compounds	IEC 62321
Hexavalent chromium compounds	IEC 62321
Polybrominated biphenyls (PBBs)	IEC 62321
Polybrominated diphenyl ethers (PBDEs)	IEC 62321
Phthalates	IEC 62321
Polycyclic Aromatic Hydrocarbons (PAHs)	AfPS GS 2019:01 PAK
BFR&CFR (As bromine and chlorine)	BS EN 14582
Nickel and its compounds	EN 1811
Red phosphorous Formaldehyde	Pyrolyzer-GC/MS ASTM E1333/ ASTM D6007

7 Banned substances table

Table 2. List of Polybrominated biphenyls (PBBs)

Substances	CAS No.
Bromobiphenyl Ether	101-55-3
Dibromobiphenyl Ether	2050-47-7
Tribromobiphenyl	64258-03-3
Tetrabromobiphenyl	40088-45-7
Pentabromobiphenyl	563070-79-0; 67888-97-5
Hexabromobiphenyl	59080-40-9, 36355-01-8, 67774-32-7
Heptabrombiphenyl	6355-01-8
Octabrombiphenyl	61288-13-9
Nonabromobiphenyl	27753-52-2
Decabromobiphenyl	13654-09-6

Table 3. List of Polybrominated diphenyl ethers (PBDEs)

Substances	CAS No.
Bromobiphenyl Ether	101-55-3
Dibromobiphenyl Ether	2050-47-7
Tribromobiphenyl Ether	49690-94-0
Tetrabromobiphenyl Ether	40088-47-9
Pentabromobiphenyl Ether	32534-81-9
Hexabromobiphenyl Ether	36483-60-0
Heptabromobiphenyl Ether	68928-80-3
Octabromobiphenyl Ether	32536-52-0
Nonabromobiphenyl Ether	63936-56-1
Decabromobiphenyl Ether	1163-19-5

Table 4. List of banned Specific azo and Benzidine-based compounds

Substances	CAS No.
4-aminodiphenyl and its chlorides	92-67-1
4-chloro-o-toluidine	95-69-2
2-naphthylamine and its chlorides	91-59-8
o-aminoazotoluene	97-56-3
2-amino-4-nitrotoluene	99-55-8
p-chloroanifine	106-47-8
2, 4-diaminoanisole	615-05-4
4, 4'-diaminodiphenylmethane; 4,4'-methylenebisbenzeneamine	101-77-9
3, 3'-dichlorobenzidine	91-94-1
3, 3'-dimethlxybenzidion;	119-90-4
3, 3'-dimethylbenzidine;	119-93-7
3,3'-dimethyl-4,4'-diaminodiphenylmethane	838-88-0
p-cresidine	120-71-8
4, 4'-methylene-bis- (2-chloro aniline);	101-14-4
4, 4'-oxideaniline	101-80-4
4, 4'-thiodianiline	139-65-1
o-toluidine	95-53-4
2, 4-tolluylenediamine	95-80-7
2, 4, 5-trimethylaniline	137-17-7
4-aminoazobenzene	60-09-3
4-chloro-2-methylaniline	95-69-2
5-Nitro-ortho-toluidine	99-55-8
4-methoxy-m-phenylendiamine	615-05-4
o-Dianisidine	119-90-4
4,4'-Methylene-bis(2-methylaniline)	838-88-0
5-Methyl-o-Anisidine	120-71-8
4,4'-Methylenebis-(2-Chlorobenzenamine)	101-14-4
4,4'-thiobisbenzenamine	139-65-1
Toluene-2,4-Diamine	95-80-7
2,4,5-Trimethylaniline	137-17-7
o-Anisidine	90-04-0
1,3-Naphthalenedi-sulfonic acid, 7-hydroxy-8-[2-[4'-[2-(4- hydroxyphenyl) diazenyl][1,1'-biphenyl]-4-yl]diazenyl]-	117-33-9
1,3,6-Naphthalenetri-sulfonic acid, 8-hydroxy-7-[2-[4'-[2-(2- hydroxy-1-naphthalenyl)diazenyl][1,1'-biphenyl]-4- yl]diazenyl]-, lithium salt (1:3)	65150-87-0
2,7-Naphthalenedi-sulfonic acid,5-amino-3-[2-[4'-[2-(7-amino-1-hydroxy-3-sulfo-2 -naphthalenyl) diazenyl][1,1'- biphenyl]-4-yl]diazenyl]-4-hydroxy-, sodium salt (1:2)	68214-82-4

Substances	CAS No.
2,7-Naphthalenedi-sulfonic acid, 4-amino-5-hydroxy-3-[2-[4'- [2-[2-hydroxy-4- [(2-methylphenyl)amino] phenyl]diazenyl][1,1'-biphenyl]-4-yl]diazenyl]-6-(2- phenyldiazenyl)-	72379-45-4
2,7-Naphthalenedi-sulfonic acid, 4-amino-5-hydroxy [[[(substituted phenylamino)] substituted phenylazo] diphenyl]azo-, phenylazo-, disodium salt.	Accession No. 21808 CAS No. CBI (NA)
4-(Substituted naphthalenyl)azo diphenylyl azo-substituted carbopolycycle azo benzene-sulfonic acid, sodium salt	Accession No. 24921 CAS No. CBI (NA)
4-(Substituted phenyl)azo biphenylyl azo-substituted carbopolycycloazo benzene-sulfonic acid, sodium salt	Accession No. 26256 CAS No. CBI (NA)
4-(Substituted phenyl)azo biphenylyl azo—substituted carbo- polycycle azo benzene-sulfonic acid, sodium salt	Accession No. 26267 CAS No. CBI (NA)
Phenylazoamino-hydroxynaphthalenylazobiphenylazo substituted benzene sodium sulfonate	Accession No. 26701 CAS No. CBI (NA)
[1,1'-Biphenyl]-4,4'-diamine	92-87-5
[1,1'-Biphenyl]-4,4'-diamine, dihydrochloride	531-85-1
C.I. Direct Red 28	573-58-0
C.I. Direct Black 38	1937-37-7
C.I. Direct Red 44	2302-97-8
C.I. Direct Blue 2	2429-73-4
C.I. Direct Orange 8	2429-79-0
C.I. Direct Brown 31	2429-81-4
C.I. Direct Brown 2	2429-82-5
Direct Black 4	2429-83-6
C.I. Direct Red 1	2429-84-7
C.I. Direct Brown 1:2	2586-58-5
C.I. Direct Blue 6	2602-46-2
C.I. Direct Brown 6	2893-80-3
C.I. Direct Red 37	3530-19-6
C.I. Acid Red 85	3567-65-5
C.I. Direct Green 1	3626-28-6
C.I. Direct Brown 1	3811-71-0
C.I. Direct Green 6	4335-09-5
C.I. Acid Black 94	6358-80-1
C.I. Direct Brown 27	6360-29-8
C.I. Direct Brown 154	6360-54-9
C.I. Direct Brown 74	8014-91-3
C.I. Direct Brown 95	16071-86-6

Table 5. list of banned Organiostannic (organotin) compounds

Substances	CAS No.
Tributyl tin bromide	1461-23-0
Triphenyl tin	668-34-8
Triphenyl tin bromide	1461-23-0
Triphenyl tin chloride	639-58-7
Triphenyl tin hydroxide	76-87-9
Triphenyl tin N,N-Dimethyldithiocarbamate	1803-12-9
Triphenyl tin fluoride(fentin fluoride)	379-52-2
Triphenyl tin acetate (fentin acetate)	900-95-8
Triphenyl tin fatty acid salts	18380-71-7
Triphenyl tin chloroacetate	7094-94-2
Triphenyl tin methacrylate	2155-70-6
Bis(tributy tin) fumarate	6454-35-9
Triphenyl tin fluoride	1983-10-4
Bis(tributy tin)2,3-dibromosuccinate	31732-71-5
Triphenyl tin acetate	56-36-0
Triphenyl tin laurate	3090-36-6
Trioctyltin chloride	2587-76-0
Triethyltin hydroxide	994-32-1
Triethyltin chloride	994-31-0
Dioctyltin oxide	870-08-6
Dioctyltin dichloride	3542-36-7
Dioctyltin maleate	16091-18-2
Dibutyltin oxide	818-08-6
Dibutyltin dichloride;	683-18-1
Di-μ-oxo-di-n-butylstanniohydroxyborane (DBB)	75113-37-0
Tributyl tin bromide	1461-23-0

Table 6. List of banned POPs substances

Substance name	CAS
Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds	335-67-1 (and others)
Tetrabromodiphenyl ether	40088-47-9 (and others
Pentabromodiphenyl ether	32534-81-9 (and others)
Hexabromodiphenyl ether	36483-60-0 (and others)
Heptabromodiphenyl ether	68928-80-3 (and others)
Bis(pentabromophenyl)ether (decabromodiphenyl ether; decaBDE)	1163-19-5
Perfluorooctane sulfonic acid and its derivatives (PFOS)	307-35-7; 1691-99-2; 1763-23-1; 2795-39-3; 4151-50-2 24448-09-7; 29081-56-9; 29457-72-5; 31506-32-8 56773-42-3; 70225-14-8; 251099-16-8 (and others)
DDT	50-29-3
Chlordane	57-74-9
Hexachlorocyclohexanes, including lindane	58-89-9; 319-84-6; 319-85-7; 608-73-1
Dieldrin	60-57-1
Endrin	72-20-8
Heptachlor	76-44-8
Endosulfan	115-29-7;959-98-8;33213-65-9
Hexachlorobenzene	118-74-1
Chlordecone	143-50-0
Aldrin	309-00-2
Pentachlorobenzene	608-93-5
Polychlorinated Biphenyls (PCB)	1336-36-3 (and others)
Mirex	2385-85-5
Toxaphene	8001-35-2
Hexabromobiphenyl	36355-01-8
Hexabromocyclododecane (HBCDD)	25637-99-4; 3194-55-6; 134237-50-6; 134237-51-7 134237-52-8
Hexachlorobutadiene	87-68-3
Pentachlorophenol and its salts and esters	87-86-5 (and others)
Polychlorinated naphthalenes	70776-03-3 (and others)
Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs)	85535-84-8
Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)	-
Polycyclic aromatic hydrocarbons (PAHs)	-

Table 7. List of banned PAHs

Substances	CAS No.
Benzo[a]pyrene	50-32-8
Benzo[e]pyrene	192-97-2
Benzo[a]anthracene	56-55-3
Benzo[b]fluoranthene	205-99-2
Benzo[j]fluoranthene	205-82-3
Chrysene	218-01-9
Dibenzo[a,h]anthracene	53-70-3
Benzo[ghi]perylene	191-24-2
Indeno[c,d]pyrene	193-39-5
Phenanthrene	85-1-8
Pyrene	129-00-0
Anthracene	120-12-7
Fluoranthene	206-44-0
Naphthalene	91-20-3
Benzo[a]pyrene	50-32-8

Table 8. List of banned Substances depleting the ozone layer

Ozone Depleting Chemicals	CAS No.	Ozone Depleting Chemicals	CAS No.
Trichlorofluoromethane (CFC-11)	75-69-4	Dichlorodifluoromethane (CFC-12)	75-71-8
Chlorotrifluoromethane (CFC-13)	75-72-9	Pentachlorofluoroethane (CFC-111)	354-56-3
Tetrachlorodifluoroethane (CFC-112)	76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane (CFC-112) 1,1,1,2-Tetrachloro-2,2-difluoroethane(CFC-112a)	76-12-0 76-11-9
Trichlorotrifluoroethane (CFC-113)	76-13-1	1,1,2-Trichloro-1,2,2 trifluoroethane (CFC-113) 1,1,1-Trichloro-2,2,2 trifluoroethane (CFC-113a)	76-13-1 354-58-5
Dichlorotetrafluoroethane (CFC-114)	76-14-2	Monochloropentafluoroethane (CFC-115)	76-15-3
Heptachlorofluoropropane (CFC-211)	422-78-6,	1,1,1,2,2,3,3-Heptachloro-3-fluoropropane (CFC-211aa) 1,1,1,2,3,3,3-Heptachloro-2-fluoropropane (CFC-211ba)	135401-87-5 422-78-6 422-81-1
Hexachlorodifluoropropane (CFC-212)	3182-26-1	Pentachlorotrifluoropropane (CFC-213)	2354-06-5; 134237-31-3
Tetrachlorotetrafluoropropane (CFC-214)	29255-31-0	1,2,2,3-Tetrachloro-1,1,3,3-tetrafluoropropane (CFC-214aa) 1,1,1,3-Tetrachloro-2,2,3,3-tetrafluoropropane (CFC-214cb)	2268-46-4 '–
Trichloropentafluoropropane (CFC-215)	1599-41-3	1,2,2-Trichloropentafluoropropane (CFC-215aa) 1,2,3-Trichloropentafluoropropane (CFC-215ba) 1,1,2-Trichloropentafluoropropane (CFC-215bb) 1,1,3-Trichloropentafluoropropane (CFC-215ca) 1,1,1-Trichloropentafluoropropane (CFC-215cb)	1599-41-3 76-17-5 - - 4259-43-2
Dichlorohexafluoropropane (CFC-216)	661-97-2	Monochloroheptafluoropropane (CFC-217)	422-86-6; 76-18-6
Dibromodifluoromethane (Halon 1202)	75-61-6	Bromochlorodifluoromethane (Halon 1211)	353-59-3
Bromotrifluoromethane (Halon 1301)	75-63-8	Dibromotetrafluoroethane (Halon 2402)	124-73-2
Tetrachloromethane (carbon tetrachloride)	56-23-5	1,1,1-Trichloroethane (methyl chloroform) and its isomers except 1,1,2-trichloroethane	71-55-6
Dibromotrifluoropropane	431-21-0	Bromotetrafluoropropane	679-84-5
Tribromofluoropropane	75372-14-4	Dibromodifluoropropane	460-25-3
Bromotrifluoropropane	421-46-5	Dibromofluoropropane	51584-26-0
Bromodifluoropropane	–	Bromofluoropropane	1871-72-3
Bromochloromethane	74-97-5	Sulfur hexafluoride	2551-62-4
Bromomethane (methyl bromide)	74-83-9	Bromoethane (ethyl bromide)	74-96-4
1-Bromopropane (n-propyl bromide)	106-94-5	Trifluoroiodomethane (trifluoromethyl iodide)	2314-97-8
Chloromethane (methyl chloride)	74-87-3	Dibromofluoromethane	1868-53-7
Bromodifluoromethane	1511-62-2	Bromofluoromethane	373-52-4
Tetrabromofluoroethane	306-80-9	Tribromodifluoroethane	–
Dibromotrifluoroethane	354-04-1	Bromotetrafluoroethane	124-72-1

Ozone Depleting Chemicals	CAS No.	Ozone Depleting Chemicals	CAS No.
Tribromofluoroethane	–	Dibromodifluoroethane	75-82-1
Bromotrifluoroethane	421-06-7	Dibromofluoroethane	358-97-4
Bromodifluoroethane	420-47-3	Bromofluoroethane	762-49-2
Hexabromofluoropropane	–	Pentabromodifluoropropane	–
Tetrabromotrifluoropropane	–	Tribromotetrafluoropropane	–
Dibromopentafluoropropane	431-78-7	Bromohexafluoropropane	2252-78-0
Pentabromofluoropropane	–	Tetrabromodifluoropropane	–
Tribromotrifluoropropane	–	Dibromotetrafluoropropane	–
Bromopentafluoropropane	460-88-8	Tetrabromofluoropropane	–
Tribromodifluoropropane	70192-80-2	Dichlorofluoromethane (HCFC-21)	75-43-4
Chlorodifluoromethane (HCFC-22)	75-45-6	Chlorofluoromethane (HCFC-31)	593-70-4
Tetrachlorofluoroethane (HCFC-121)	134237-32-4	1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121)	354-14-3
1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)	354-11-0	Trichlorodifluoroethane (HCFC-122)	41834-16-6
1,2,2-Trichloro-1,1-difluoroethane (HCFC-122)	354-21-2	1,1,2-Trichloro-1,2-difluoroethane (HCFC-122a)	354-15-4
1,1,1-Trichloro-2,2-difluoroethane (HCFC-122b)	354-12-1	Dichlorotrifluoroethane (HCFC-123)	34077-87-7
Dichloro-1,1,2-trifluoroethane	90454-18-5	2,2-dichloro-1,1,1-trifluroethane	306-83-2
1,2-dichloro-1,1,2-trifluroethane (HCFC-123a)	354-23-4	1,1-dichloro-1,2,2-trifluroethane (HCFC-123b)	812-04-4
Chlorotetrafluoroethane (HCFC-124)	63938-10-3	2-chloro-1,1,1,2-tetrafluoroethane	2837-89-0
1-chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	354-25-6	Trichlorofluoroethane (HCFC-131)	27154-33-2, 134237-34-6
1-Fluoro-1,2,2-trichloroethan	359-28-4	1,1,2-Trichloro-1-fluoroethane (HCFC-131a)	811-95-0
1,1,1-trichloro-2-fluoroethane (HCFC-131b)	2366-36-1	Dichlorodifluoroethane (HCFC-132)	25915-78-0
1,2-Dichloro-1,2-difluoroethane (HCFC-132)	431-06-1	1,1-Dichloro-2,2-difluoroethane (HCFC-132a)	471-43-2
1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	1649-08-7	1,1-Dichloro-1,2-difluoroethane (HCFC-132c)	1842-05-3
Chlorotrifluoroethane (HCFC-133)	1330-45-6, 431-07-2	1-Chloro-1,2,2-trifluoroethane (HCFC-133)	1330-45-6
2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	75-88-7	1-Chloro-1,1,2-trifluoroethane (HCFC-133b)	421-04-5
Dichlorofluoroethane (HCFC-141)	25167-88-8	1,2-Dichloro-1-fluoroethane (HCFC-141)	430-57-9
1,1-Dichloro-2-fluoroethane (HCFC-141a)	430-53-5	1,1-Dichloro-1-fluoroethane (HCFC-141b)	1717-00-6
Chlorodifluoroethane (HCFC-142)	25497-29-4	2-Chloro-1,1-Difluoroethane (HCFC-142)	338-65-8
1-Chloro-1,1-difluoroethane (HCFC-142b)	75-68-3	1-Chloro-1,2-difluoroethane (HCFC-142a)	338-64-7
Chlorofluoroethane (HCFC-151)	110587-14-9	1-Chloro-2-fluoroethane (HCFC-151)	762-50-5
1-Chloro-1-fluoroethane (HCFC-151a)	1615-75-4	Hexachlorofluoropropane (HCFC-221)	134237-35-7, 29470-94-8
1,1,1,2,2,3-Hexachloro-3-fluoropropane (HCFC-221ab)	422-26-4	Pentachlorodifluoropropane (HCFC-222)	134237-36-8
1,1,1,3,3-pentachloro-2,2-difluoropropane (HCFC-222ca)	422-49-1	1,2,2,3,3-pentachloro-1,1-difluoropropane (HCFC-222aa)	422-30-0
Tetrachlorotrifluoropropane (HCFC-223)	134237-37-9	1,1,3,3-Tetrachloro-1,2,2-trifluoropropane (HCFC-223ca)	422-52-6
1,1,1,3-Tetrachloro-2,2,3-trifluoropropane (HCFC-223cb)	422-50-4	Trichlorotetrafluoropropane (HCFC-224)	134237-38-0

Ozone Depleting Chemicals	CAS No.	Ozone Depleting Chemicals	CAS No.
1,3,3-Trichloro-1,1,2,2-tetrafluoropropane (HCFC-224ca)	422-54-8	1,1,3-Trichloro-1,2,2,3-tetrafluoropropane (HCFC-224cb)	422-53-7
1,1,1-Trichloro-2,2,3,3-tetrafluoropropane (HCFC-224cc)	422-51-5	Dichloropentafluoropropane (HCFC-225)	127564-92-5
2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)	128903-21-9	2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)	422-48-0
1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)	422-44-6	3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	422-56-0
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	507-55-1	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	13474-88-9
1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)	431-86-7	1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea)	136013-79-1
1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	111512-56-2	Chlorohexafluoropropane (HCFC-226)	134308-72-8
2-Chloro-1,1,1,3,3,3-hexafluoro-propane (HCFC-226da)	431-87-8	Pentachlorofluoropropane (HCFC-231)	134190-48-0
1,1,1,2,3-pentachloro-2-fluoro-propane (HCFC-231bb)	421-94-3	Tetrachlorodifluoropropane (HCFC-232)	134237-39-1
1,1,1,3-Tetrachloro-3,3-difluoropropane (HCFC-232fc)	460-89-9	Trichlorotrifluoropropane (HCFC-233)	134237-40-4
1,1,1-Trichloro-3,3,3-trifluoropropane (HCFC-233fb)	7125-84-0 7125-83-9	Dichlorotetrafluoropropane (HCFC-234)	127564-83-4
1,2-Dichloro-1,2,3,3-tetrafluoropropane (HCFC-234db)	425-94-5	Chloropentafluoropropane (HCFC-235)	134237-41-5
1-Chloro-1,1,3,3,3-pentafluoropropane (HCFC-235fa)	460-92-4	Tetrachlorofluoropropane (HCFC-241)	134190-49-1
1,1,2,3-Tetrachloro-1-fluoropropane (HCFC-241db)	666-27-3	Trichlorodifluoropropane (HCFC-242)	134237-42-6
1,3,3,Trichloro-1,1-difluoropropane (HCFC-242fa)	460-63-9	Dichlorotrifluoropropane (HCFC-243)	134237-43-7
1,1-dichloro-1,2,2-trifluoropropane	7125-99-7	2,3-dichloro-1,1,1-trifluoropropane	338-75-0
3,3-dichloro-1,1,1-trifluoropropane	460-69-5	Chlorotetrafluoropropane (HCFC-244)	134190-50-4
3-Chloro-1,1,2,2-tetrafluoropropane(HCFC-244ca)	679-85-6	1-Chloro-1,1,2,2-tetrafluoropropane (HCFC-244cc)	421-75-0
Trichlorofluoropropane (HCFC-251)	134190-51-5	1,1,3-Trichloro-1-fluoropropane (HCFC-251fb)	818-99-5
1,1,2-Trichloro-1-fluoropropane (HCFC-251dc)	421-41-0	Dichlorodifluoropropane (HCFC-252)	134190-52-6
1,3-Dicloro-1,1-difluoropropane (HCFC-252fb)	819-00-1	Chlorotrifluoropropane (HCFC-253)	134237-44-8
3-chloro-1,1,1-trifluoropropane (HCFC-253fb)	460-35-5	Dichlorofluoropropane (HCFC-261)	134237-45-9
1,1-Dichloro-1-fluoropropane (HCFC-261fc)	7799-56-6	1,2-Dichloro-2-fluoro-propane (HCFC-261ba)	420-97-3
Chlorodifluoropropane (HCFC-262)	134190-53-7	1-Chloro-2,2-difluoropropane (HCFC-262ca)	420-99-5
2-Chloro-1,3-difluoropropane (HCFC-262da)	102738-79-4	1-Chloro-1,1-difluoropropane (HCFC-262fc)	421-02-3
Chlorofluoropropane (HCFC-271)	134190-54-8	2-Chloro-2-fluoropropane (HCFC-271ba)	420-44-0
1-Chloro-1-fluoropropane (HCFC-271fb)	430-55-7		

8 References

1. Directive 2011/65/EU, restriction of the use of certain hazardous substances (RoHS), amended by Directive 2014/1/EU, Directive (EU) 2015/863, Directive (EU) 2018/736, Directive (EU) 2018/737, Directive (EU) 2018/738, Directive (EU) 2018/739, Directive (EU) 2018/740, Directive (EU) 2018/741, Directive (EU) 2018/742.
2. IEC 62321
3. Directive 2006/66/EC, batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC, amended by Directive 2008/12/EC, Directive 2008/103/EC, Directive 2013/56/EU.
4. Directive 94/62/EC on packaging and packaging waste, amending by Directive 2004/12/EC, Directive 2005/20/EC, Regulation (EC) No 219/2009, Directive 2013/2/EU.
5. Regulation (EC) No 1907/2006, Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
6. Stockholm Convention on Persistent Organic Pollutants.
7. Montreal Protocol on Substances that Deplete the Ozone Layer.
8. REGULATION (EC) No 2037/2000 on substances that deplete the ozone layer.
9. Regulation (EU) No 528/2012, making available on the market and use of biocidal products.
10. Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986.
11. EU Decision 2009/251/EC, requiring Member States to ensure that products containing the biocide dimethylfumarate are not placed or made available on the market.
12. REGULATION (EC) No 842/2006 on certain fluorinated greenhouse gases.
13. EN 1811:2011+A1:2015
14. AfPS GS 2019:01 PAK (PAH)
15. Toy Safety Directive 2009/48/EC
16. Persistent organic pollutants (POPs) RECAST REGULATION (EU) 2019/1021.

Revision history

REV.	Description	Date
24	1. Adapt to meet the latest RoHS regulation. 2. Change PBBs/PBDEs threshold limit to 100 ppm. 3. Add banned phthalates. 4. Change HBCDD threshold limit to 100 ppm. 5 .Add banned halogenated diphenyl methane compounds. 5. Add 5-1-14 Halogenated diphenyl methane compounds	01/23/2017
25	1. Add requirement for enclosed plastic for adapters. 2. Updated RoHS exemptions expiry dates base on Directive (EU) 2018/736, Directive (EU) 2018/737, Directive (EU) 2018/738, Directive (EU) 2018/739, Directive (EU) 2018/740, Directive (EU) 2018/741, and Directive (EU) 2018/742. 3. Renew requirement for formaldehyde in plywood. 4. Move restriction on surfactants, trichloroethylene, and tetrachloroethylene to 10000-2009. 5. Add restriction on Di(2-propylheptyl) phthalate (DPHP). 6. Editorial changes.	10/05/2018
25.1	1. Typo correction. 2. Modify PVC exemptions. 3. Reorganized POPs substance table. 4. Remove arsenic exemption for copper foils. 5. Modify scope for plastic case halogen free plan to exclude wall mount adaptors due to safety regulation.	11/12/2018
26	1. Update RoHS exemptions expiry dates to the latest status. 2. Renew control threshold of PFOA to 25 ppb, move PFOS substances to POPs list. 3. Renew restrictions on batteries. 4. Renew POPs substances list. 5. Modify formaldehyde threshold limit to 0.5 ppm for pallets and wooden boxes. 6. Add banned substances 2,4,6-Tri-tert-butylphenol and specific benzotriazole UV absorbers. 7. Update banned PAHs from 18 substances to 15.	08/20/2020
27	Added attachment.	09/01/2020
28	1. Typo correction. 2. Modify formaldehyde threshold for plywood board and wood shaving block. 3. Update table 6 for latest EU POPs regulation. (Combined PFOA and POPs table)	09/28/2020