ThreeBond

ThreeBond Group Management Criteria of Environmental Impact materials Ver.6

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1. Target of this management standard

① Target products — Products delivered to ThreeBond and ThreeBond products (raw materials, containers, packaging materials, auxiliary materials *, application equipment)

② Target management process — ThreeBond product manufacturing process

2. Responsibility

The person in charge of R&D Administration Department is responsible for reviewing the chemical substances covered by ThreeBond Group Management Criteria of Environmental Impacts

3. Revision of ThreeBond Group Management Criteria of Environmental Impacts

The person in charge of R&D Administration Department will consider changing the management standard for ThreeBond Group Management Criteria of Environmental Impacts according to the following procedure.

① Create a change plan with considering the following contents.
- Domestic and overseas legal information on chemical substances
- Market trend
- Customer's Management Criteria of Environmental Impacts
- Other necessary items

② Considering the importance of the changes, if necessary, send the changes information to the relevant departments in the interface contact form.

③ If necessary, the person in charge of the Technical Service Department will instruct the Design Review Committee to discuss the matter.

④ After consultation with the Design Review Committee, the Quality Assurance Committee will discuss when it's necessary.

⑤ After consultation and approval by the Quality Assurance Committee, the revised document will be registered and completed.

* About auxiliary materials

Auxiliary materials refer to materials other than the raw materials, containers, and packaging materials for ThreeBond products.

Examples are described below.

◆ Example of auxiliary materials
- Dispensing hose
- Tube
- Workbench mat
- Poly cup
- Label
- Tape
- Gloves
- O-ring
- Packing
- Resin spatula
- Cushioning agent
- Plastic bag
- Pallet
- Ink for seal
- Wetted part of manufacturing equipment

ThreeBond Group Management Criteria of Environmental Impact materials Ver.6

No.	Category	Name & group of Environmental Impact materials	ThreeBond Management Criteria	Remarks
1	Prohibited substances	Cadmium and its compounds	Prohibit intentional use or less than 100 ppm	Container and package materials must be (1+2+3+4)≦ 100ppm
2	Prohibited substances	Lead and its compound	Prohibit intentional use or less than 1000 ppm	Container and package materials must be (1+2+3+4)≦ 100ppm
3	Prohibited substances	Mercury and its compound	Prohibit intentional use or less than 1000 ppm	Container and package materials must be (1+2+3+4)≦ 100ppm
4	Prohibited substances	Hexavalent chromium compound	Prohibit intentional use or less than 1000 ppm	Container and package materials must be (1+2+3+4)≦ 100ppm
5	Prohibited substances	Polybromobiphenyls (PBB)	Prohibit intentional use or less than 1000 ppm	
6	Prohibited substances	Polybromodiphenylethers (PBDE)	Prohibit intentional use or less than 1000 ppm	
7	Prohibited substances	Trisubstituted organic tin compound (tributyltin compound, triphenyltin compound)	Prohibit intentional use or less than 1000 ppm (as tin element)	
8	Prohibited substances	Polychlorinated biphenyls (PCB)	Prohibit intentional use	
9	Prohibited substances	Polychlorinated naphthalene (PCN)	Prohibit intentional use	Chlorine number 1 or more
10	Prohibited substances	Polychlorinated terphenyl (PCT)	Prohibit intentional use or less than 50ppm	
11	Prohibited substances	Polyvinyl chloride (PVC)	Prohibit intentional use	
12	Prohibited substances	Chlorinated paraffin (CP)	Prohibit intentional use or less than 1000 ppm	Applicable only to carbon chain length 10 to 13 (SCCP) (for carbon chain length 14 to 17 (MCCP), the amount of SCCP by-product is less than 10,000 ppm)
13	Prohibited substances	Asbestos	Do not use	
14	Prohibited substances	Specific aromatic amine	Prohibit intentional use or less than 30ppm	24 kinds of aromatic amines in Appendix 1 by reductive decomposition
15	Prohibited substances	Azo dyes and pigments that form amines corresponding to No. 14	Prohibit intentional use or generated Specific amine Less than 30ppm	Azo dyes / pigments listed in Appendix 2 (azo dyes / pigments that generate 30 ppm or more of 24 amines in Appendix 1 by reductive decomposition)
16	Prohibited substances	Ozone depleting substances	Prohibit intentional use or use in manufacturing process	Substances listed in Appendix 3
17	Prohibited substances	Radioactive substance	Prohibit intentional use	
18	Prohibited substances	Bis (2-ethylhexyl) phthalate (DEHP)	Prohibit intentional use or less than 1000 ppm	Containers, packaging materials, and auxiliary materials must be less than 1000ppm.
19	Prohibited substances	Dibutyl phthalate (DBP)	Prohibit intentional use or less than 1000 ppm	Containers, packaging materials, and auxiliary materials must be less than 1000ppm.
20	Prohibited substances	Butylbenzyl phthalate (BBP)	Prohibit intentional use or less than 1000 ppm	Containers, packaging materials, and auxiliary materials must be less than 1000ppm.
21	Prohibited substances	Diisobutyl phthalate (DIBP)	Prohibit intentional use or less than 1000 ppm	Containers, packaging materials, and auxiliary materials must be less than 1000ppm.
22	Prohibited substances	Phthalates (DEHP, DBP, BBP, DIBP)	Less than 1000ppm in total concentration of 4 kinds	The total concentration of the four types of containers, packaging materials, and auxiliary materials must be less than 1000 ppm.
23	Prohibited substances	Hexabromocyclododecane (HBCDD)	Prohibit intentional use or less than 100 ppm	
24	Prohibited substances	PFOS (perfluorooctane sulfonic acid and its salts)	Prohibit intentional use or less than 1000 ppm	Substances listed in Appendix 4
25	Prohibited substances	PFOA (perfluorooctanoic acid, its salts and its esters)	Prohibit intentional use or less than 25 ppb for PFOA and its salts Less than 1 ppm for PFOA related substances	Substances listed in Attached Table 5 (when multiple target substances are contained, the total concentration is less than 1 ppm (1000 ppb))
26	Prohibited substances	Specific benzotriazole: 2- (2H-1,2,3-benzotriazol-2-yl) -4,6-di-tert-butylphenol	Prohibit intentional use or less than 1000 ppm	
27	Prohibited substances	Dimethyl fumarate (DMF)	Prohibit intentional use or less than 0.1 ppm	
28	Prohibited substances	Polycyclic aromatic hydrocarbon (PAH)	Prohibit intentional use or less than 1 ppm	Substances listed in Appendix 6 (less than 0.5 ppm when used in materials that come into contact with the skin for 30 seconds or more, or that are repeatedly in contact with the skin for a short period of time)
29	Prohibited substances	Conflict minerals	Prohibited use (including inclusion of impurities)	DRC and its surrounding 5 domestically produced minerals (gold, tin, tungsten, tantalum, cobalt) derived from smelters not listed in Conflict-Free Smelters
30	Prohibited substances	Formaldehyde	Prohibit intentional use or less than 75 ppm	Composite wood(plywood,particle board,medium density fiberboard)products or components:(Intentional use) Less than 0.0075 (75 ppm) weight % of Fabric products
31	Prohibited substances	Disubstituted organotin compounds (dibutyltin compounds, dioctyltin compounds	Prohibit intentional use and less than 1000 ppm (as tin element)	
32	Reported substance	chemSHERPA controlled substances	Content of 0.1 wt% or more is reported	See latest version https://chemsherpa.net/tool#declarable

Appendix 1: 24 aromatic amines that should not be generated by reductive decomposition of azo compounds

No.	CAS No.	Substance name in Cabinet Order	Another name used in JIS L 1940 etc.	Substance
1	92-67-1	4-aminodiphenyl	Biphenyl-4-ylamine 4-aminobiphenyl Kiseniruamin	4-aminobiphenyl
2	92-87-5	Benzidine	—	benzidine
3	95-69-2	4-chloro-2-methylaniline	4-chloro-ortho-toluidine	—
4	91-59-8	2-naphthylamine (also known as beta-naphthylamine)	—	2-naphthylamine
5	97-56-3	2-methyl-4- (2-tolylazo) aniline	Ortho- aminoazotoluene 4 -amino-2 ', 3-dimethylazobenzene 4-ortho-tolylazo-ortho-toluidine	—
6	99-55-8	2-methyl-5-nitroaniline	5-nitro-ortho-toluidine 2-amino-4-nitrotoluene	—
7	106-47-8	p-chloroaniline	4-chloroaniline	—
8	615-05-4	2,4-diaminoanisole	4-methoxy-meta-phenylenediamine	4-methoxy-m-phenylenediamine
9	101-77-9	4,4'-methylenedianiline	4,4'-diaminodiphenylmethane	4,4'-diaminodiphenylmethane
10	91-94-1	3,3'-dichlorobenzidine	3,3'-Dichlorobiphenyl-4,4'-ylenediamine	3,3'-dichlorobenzidine
11	119-90-4	3,3'-dimethoxybenzidine	o-dianisidine	3,3'-dimethoxybenzidene
12	119-93-7	3,3'-Dimethylbenzidine (also known as ortho-tolidine)	4,4'-bi-o-toluidine	o-tolidine
13	838-88-0	4,4'-diamino-3,3'-dimethyldiphenylmethane	4,4'-Methylenedi-o-toluidine 3,3'-dimethyl-4,4'-diaminodiphenylmethane	4,4'-methylenedi-o-toluidine
14	120-71-8	2-methoxy-5-methylaniline	6-methoxy-meta-toluidine p-cresidine	2-Methoxy-5-methylaniline
15	101-14-4	3,3'-dichloro-4,4'-diaminodiphenylmethane	4,4'-Methylene-bis- (2-chloroaniline) 2,2'-dichloro-4,4'-methylenedianiline	4,4'-methylene-bis-(2-chloro-aniline)
16	101-80-4	4,4'-diaminodiphenyl ether	4,4'-oxydianili	4,4'-diaminobiphenyl ether
17	139-65-1	4,4'-diaminodiphenyl sulfide	4,4'-thiodianiline	4,4'-diaminodiphenyl sulfide
18	95-53-4	o-Toluidine	2-aminotoluene	o-toluidine
19	95-80-7	2,4-diaminotoluene	4-Methyl-meta-phenylenediamine 2,4- toluenediamine	2,4-diaminotoluene
20	137-17-7	2,4,5-trimethylaniline	—	2,4,5-trimethylaniline
21	90-04-0	o-anisidine	2-methoxyaniline	o-anisidine
22	60-09-3	p-phenylazoaniline	4-aminoazobenzene	4-amino azobenzene
23	95-68-1	2,4-dimethylaniline	2,4-xylidine	2,4-xylidine
24	87-62-7	2,6-dimethylaniline	2,6-xylidine	2,6-xylidine

Appendix 2: Azo dyes and pigments that form specific aromatic amines

No.	CAS No.	Dye name	C.I. Constitution No.
1	12217-14-0	Acid Black 29	—
2	6358-80-1	Acid Black 94	30336
3	12219-01-1	Acid Black 131	—
4	12219-02-2	Acid Black 132	—
5	72827-68-0	Acid Black 209	—
6	97199-27-4	Acid Brown 415	—
7	2429-80-3	Acid Orange 45	22195
8	5858-39-9	Acid Red 4	14710
9	5858-63-9	Acid Red 5	14905
10	5858-30-0	Acid Red 24	16140
11	6441-93-6	Acid Red 35	18065
12	3567-65-5	Acid Red 85	22245
13	8006-06-2	Acid Red 104	26420
14	6459-94-5	Acid Red 114	23635
15	8005-61-6	Acid Red 115	27200
16	6245-62-1	Acid Red 116	26660
17	90880-75-4	Acid Red 119:1	—
18	6548-30-7	Acid Red 128	24125
19	6300-53-4	Acid Red 148	26665
20	6226-78-4	Acid Red 150	27190
21	8004-55-5	Acid Red 158	20530
22	61901-41-5	Acid Red 167	—
23	6505-96-0	Acid Red 264	18133
24	6358-43-6	Acid Red 265	18129
25	6625-46-3	Acid Violet 12	18075
26	5421-66-9	Basic Brown 4	21010
27	12221-66-8	Basic Red 42	—
28	68391-30-0	Basic Red 76	12245
29	118658-98-3	Basic Red 111	—
30	12227-67-7	Basic Yellow 82	—

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No.	CAS No.	Dye name	C.I. Constitution No.
31	2429-83-6	Direct Black 4	30245
32	3626-23-1	Direct Black 29	22580
33	1937-37-7	Direct Black 38	30235
34	37372-50-2	Direct Black 154	—
35	2610-05-1	Direct Blue 1	24410
36	2429-73-4	Direct Blue 2	22590
37	2429-72-3	Direct Blue 3	23705
38	2602-46-2	Direct Blue 6	22610
39	2429-71-2	Direct Blue 8	24140
40	6428-98-4	Direct Blue 9	24155
41	4198-19-0	Direct Blue 10	24340
42	72-57-1	Direct Blue 14	23850
43	2429-74-5	Direct Blue 15	24400
44	6420-09-3	Direct Blue 21	23710
45	2586-57-4	Direct Blue 22	24280
46	2150-54-1	Direct Blue 25	23790
47	6473-33-2	Direct Blue 35	24145
48	110735-25-6	Direct Blue 151	24175
49	12222-02-5	Direct Blue 160	—
50	12235-72-2	Direct Blue 173	—
51	71838-51-2	Direct Blue 192	—
52	6771-80-8	Direct Blue 215	24415
53	6420-22-0	Direct Blue 295	23820
54	3811-71-0	Direct Brown 1	30045
55	2586-58-5	Direct Brown 1:2	30110
56	2429-82-5	Direct Brown 2	22311
57	2893-80-3	Direct Brown 6	30140
58	33363-87-0	Direct Brown 25	36030
59	6360-29-8	Direct Brown 27	31725
60	2429-81-4	Direct Brown 31	35660

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No.	CAS No.	Dye name	C.I. Constitution No.
61	1324-87-4	Direct Brown 33	35520
62	4623-91-0	Direct Brown 51	31710
63	3476-90-2	Direct Brown 59	22345
64	8014-91-3	Direct Brown 74	36300
65	6483-77-8	Direct Brown 79	30050
66	16071-86-6	Direct Brown 95	30145
67	3626-29-7	Direct Brown 101	31740
68	6360-54-9	Direct Brown 154	30120
69	64743-15-3	Direct Brown 222	30368
70	76930-14-8	Direct Brown 223	—
71	3626-28-6	Direct Green 1	30280
72	4335-09-5	Direct Green 6	30295
73	5422-17-3	Direct Green 8	30315
74	76012-70-9	Direct Green 8:1	—
75	72390-60-4	Direct Green 85	30387
76	54579-28-1	Direct Orange 1	22370
77	6637-88-3	Direct Orange 6	—
78	2868-76-0	Direct Orange 7	23380
79	2429-79-0	Direct Orange 8	22130
80	6405-94-3	Direct Orange 10	23370
81	6358-79-8	Direct Orange 108	29173
82	2429-84-7	Direct Red 1	22310
83	992-59-6	Direct Red 2	23500
84	2868-75-9	Direct Red 7	24100
85	2429-70-1	Direct Red 10	22145
86	1937-35-5	Direct Red 13	22155
87	2769-07-5	Direct Red 17	22150
88	6406-01-5	Direct Red 21	23560
89	6448-80-2	Direct Red 22	23565
90	6420-44-6	Direct Red 24	29185

Appendix 2: Azo dyes and pigments that form specific aromatic amines

No.	CAS No.	Dye name	C.I. Constitution No.
91	3687-80-7	Direct Red 26	29190
92	573-58-0	Direct Red 28	22120
93	3530-19-6	Direct Red 37	22240
94	6358-29-8	Direct Red 39	23630
95	2302-97-8	Direct Red 44	22500
96	6548-29-4	Direct Red 46	23050
97	6420-43-5	Direct Red 62	29175
98	6598-56-7	Direct Red 67	23505
99	8005-64-9	Direct Red 72	29200
100	2586-60-9	Direct Violet 1	22570
101	6472-95-3	Direct Violet 4	22555
102	2429-75-6	Direct Violet 12	22550
103	13478-92-7	Direct Violet 13	2480
104	6470-45-7	Direct Violet 21	23520
105	6426-67-1	Direct Violet 22	22480
106	6472-91-9	Direct Yellow 1	22250
107	6486-29-9	Direct Yellow 24	22010
108	6459-97-8	Direct Yellow 48	23660
109	12270-44-9	Disperse Orange 60	—
110	151126-94-2	Disperse Orange 149	—
111	61968-47-6	Disperse Red 151	26130
112	64426-35-3	Disperse Red 221	—
113	6300-37-4	Disperse Yellow 7	26090
114	6250-23-3	Disperse Yellow 23	26070
115	54077-16-6	Disperse Yellow 56	—
116	83929-90-2	Disperse Yellow 218	—
117	8003-87-0	Mordant Yellow 16	—
118	1229-55-6	Solvent Red 1	12150
119	6368-72-5	Solvent Red 19	26050
120	85-86-9	Solvent Red 23	26100

Appendix 2: Azo dyes and pigments that form specific aromatic amines

No.	CAS No.	Dye name	C.I. Constitution No.
121	85-83-6	Solvent Red 24	26105
122	4477-79-6	Solvent Red 26	26120
123	61813-90-9	Solvent Red 68	—
124	5413-75-2	Solvent Red 69	27290
125	71819-51-7	Solvent Red 164	—
126	85203-90-3	Solvent Red 215	—
127	4645-07-2	Solvent Yellow 72	—
128	118685-33-9	Trisodium bis(6-(4-anisidino)-3-sulfonato-2-(3,5-dinitro-2-oxidophenylazo)-1-naphtholato)chromate(1-)	—

Appendix 3: Ozone depleting substances (including isomers, substances subject to Montreal Protocol)

Annex	Group	Substance group	Substance name	Substance	CAS No. example
A	Ⅰ	CFCs	CFC-11	CFC-11	75-69-4
			CFC-12	CFC-12	75-71-8
			CFC-113	CFC-113	76-13-1
			CFC-114	CFC-114	76-14-2
			CFC-115	CFC-115	76-15-3
	Ⅱ	Halong	Halong-1211	Halon 1211	353-59-3
			Halong-1301	Halon 1301	75-63-8
			Halong-2402	Halon 2402	124-73-2
B	Ⅰ	Other CFCs	CFC-13	CFC-13	75-72-9
			CFC-111	CFC-111	354-56-3
			CFC-112	CFC-112	76-12-0
			CFC-211	CFC-211	422-78-6
			CFC-212	CFC-212	3182-26-1
			CFC-213	CFC-213	134237-31-3
			CFC-214	CFC-214	29255-31-0
			CFC-215	CFC-215	1599-41-3
			CFC-216	CFC-216	661-97-2
			CFC-217	CFC-217	422-86-6
	Ⅱ	Carbon tetrachloride	Carbon tetrachloride	Carbon tetrachloride	56-23-5
	Ⅲ	1,1,1-Trichloroethane (methyl chloroform)	1,1,1-Trichloroethane (methyl chloroform)	1,1,1-Trichloroethane	71-55-6
C	Ⅰ	HCFCs	HCFC-21	HCFC-21	75-43-4
			HCFC-22	HCFC-22	75-45-6
			HCFC-31	HCFC-31	593-70-4
			HCFC-121	HCFC-121	354-11-0
			HCFC-122	HCFC-122	354-21-2
			HCFC-123	HCFC-123	812-04-4
			HCFC-123 ※	HCFC-123 ※	306-83-2
			HCFC-124	HCFC-124	354-25-6
			HCFC-124 ※	HCFC-124 ※	2837-89-0
			HCFC-131	HCFC-131	27154-33-2
			HCFC-132	HCFC-132	25915-78-0
			HCFC-133	HCFC-133	75-88-7
			HCFC-141	HCFC-141	430-57-9
			HCFC-141b ※	HCFC-141b ※	1717-00-6
			HCFC-142	HCFC-142	25497-29-4
			HCFC-142b ※	HCFC-142b ※	75-68-3
			HCFC-151	HCFC-151	1615-75-4
			HCFC-221	HCFC-221	134237-35-7
			HCFC-222	HCFC-222	134237-36-8
			HCFC-223	HCFC-223	134237-37-9

Appendix 3: Ozone depleting substances (including isomers, substances subject to Montreal Protocol)

Annex	Group	Substance group	Substance name	Substance	CAS No. example
C	I	HCFCs (continued)	HCFC-224	HCFC-224	134237-38-0
			HCFC-225	HCFC-225	127564-92-5
			HCFC-225ca ※	HCFC-225ca ※	422-56-0
			HCFC-225cb ※	HCFC-225cb ※	507-55-1
			HCFC-226	HCFC-226	134308-72-8
			HCFC-231	HCFC-231	134190-48-0
			HCFC-232	HCFC-232	127564-82-3
			HCFC-233	HCFC-233	134237-40-4
			HCFC-234	HCFC-234	127564-83-4
			HCFC-235	HCFC-235	134237-41-5
			HCFC-241	HCFC-241	134190-49-1
			HCFC-242	HCFC-242	134237-42-6
			HCFC-243	HCFC-243	134237-43-7
			HCFC-244	HCFC-244	134190-50-4
			HCFC-251	HCFC-251	134190-51-5
			HCFC-252	HCFC-252	134190-52-6
			HCFC-253	HCFC-253	134237-44-8
			HCFC-261	HCFC-261	134237-45-9
			HCFC-262	HCFC-262	134190-53-7
			HCFC-271	HCFC-271	134190-54-8
	II	HBFC	CHFBr2	Dibromofluoromethane	1868-53-7
			CHF2Br	Bromodifluoromethane	1511-62-2
			CH2FBr	Bromofluoromethane	373-52-4
			C2HFBr4	Tetrabromofluoroethane	306-80-9
			C2HF2Br3	Tribromodifluoroethane	-
			C2HF3Br2	Dibromotrifluoroethane	354-04-1
			C2HF4Br	Bromotetrafluoroethane	124-72-1
			C2H2FBr3	Tribromofluoroethane	-
			C2H2F2Br2	Dibromodifluoroethane	75-82-1
			C2H2F3Br	Bromotrifluoroethane	421-06-7
			C2H3FBr2	Dibromofluoroethane	358-97-4
			C2H3F2Br	Bromodifluoroethane	359-07-9
			C2H4FBr	Bromofluoroethane	762-49-2
			C3HFBr6	Hexabromofluoropropane	-
			C3HF2Br5	Pentabromodifluoropropane	-
			C3HF3Br4	Tetrabromotrifluoropropane	-
			C3HF4Br3	Tribromotetrafluoropropane	-
			C3HF5Br2	Dibromopentafluoropropane	431-78-7
			C3HF6Br	Bromohexafluoropropane	-
			C3H2FBr5	Pentabromofluoropropane	-
			C3H2F2Br4	Tetrabromodifluoropropane	-
			C3H2F3Br3	Tribromotrifluoropropane	-
			C3H2F4Br2	Dibromotetrafluoropropane	-
			C3H2F5Br	Bromopentafluoropropane	460-88-8
			C3H3FBr4	Tetrabromofluoropropane	-
			C3H3F2Br3	Tribromodifluoropropane	70192-80-2
			C3H3F3Br2	Dibromotrifluoropropane	70192-83-5
			C3H3F4Br	Bromotetrafluoropropane	679-84-5
			C3H4FBr3	Tribromofluoropropane	75372-14-4

Appendix 3: Ozone depleting substances (including isomers, substances subject to Montreal Protocol)

Annex	Group	Substance group	Substance name	Substance	CAS No. example
C	Ⅱ	HBFC (continued)	C3H4F2Br2	Dibromodifluoropropane	460-25-3
			C3H4F3Br	Bromotrifluoropropane	421-46-5
			C3H5FBr2	Dibromofluoropropane	51584-26-0
			C3H5F2Br	Bromodifluoropropane	-
			C3H6FBr	Bromofluoropropane	352-91-0
	Ⅲ	Bromochloromethane	Bromochloromethane	Chlorobromomethane	74-97-5
E	Ⅰ	Methyl bromide	Methyl bromide	Methyl bromide	74-83-9

* Indicated substances are most likely to be used commercially.
* The above is an example, so please check the latest list.

Appendix 4: PFOS (perfluorooctane sulfonic acid and its salts)

No.	CAS No. example	Substance name
1	1763-23-1	Perfluoroctane sulfonate acid
2	45298-90-6	Perfluoroctane sulfonate anion
3	307-35-7	Perfluoro-1-octanesulfonyl fluoride
4	306975-62-2	2-Propenoic acid, 2-methyl-, dodecyl ester, polymers with 2-[methyl[(perfluoro-C4-8-alkyl)- sulfonyl]amino]ethyl acrylate and vinylidene chloride
5	2991-51-7	Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt
6	2795-39-3	Perfluorooctane sulfonate potasium salt
7	29081-56-9	Perfluorooctane sulfonate ammonium salt
8	29457-72-5	Perfluorooctane sulfonate lithium salt
9	56773-42-3	Tetraethylammoniumheptadecafluoroctansulfonate

※ The information above is an example. Please check the latest list of GADSL (link below).
https://www.gadsl.org/

Appendix 5: PFOA (perfluorooctanoic acid, its salts and its esters)

No.	CAS No. example	Substance name
1	3825-26-1	Ammonium salt of PFOA
2	206886-57-9	Cyclotetrasiloxane, 2-(4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoroundecyl)-2,4,6,8-tetramethyl-, Si-[3-(oxiranylmethoxy)propyl] derivs
3	3108-24-5	Ethylperfluorooctanoate
4	376-27-2	Methylperfluorooctanoate
5	335-66-0	Pentadecafluorooctyl fluoride
6	86508-42-1	Perfluoro compounds, C5-18
7	122402-79-3	Poly(oxy-1,2-ethanediyl), .alpha.-(4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoro-2-hydroxyundecyl)-.omega.-[(4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoro-2-hydroxyundecyl)oxy]-
8	2395-00-8	Potassium salt of PFOA
9	160336-09-4	2-Propenoic acid, C16-18-alkyl esters, polymers with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl acrylate
10	321318-71-2	2-Propenoic acid, 2-methyl-, methyl ester, telomere with 1-dodecanethiol, 2-ethylhexyl 2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-propenoate and 2-Propenoic acid
11	501098-09-5	Siloxanes and Silicones, di-Me, mono[3-[(2-methyl-1-oxo-2-propenyl)oxy]propyl group]-terminated, polymers with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-1-decanol- and 2-hydroxyethyl acrylate-blocked 2,4-TDI-trimethylolpropane polymer
12	335-93-3	Silver salt of PFOA
13	335-95-5	Sodium salt of PFOA
14	185701-89-7	Trisiloxane, 3,3'-(3,3,4,4,5,5,6,6,7,7,8,8-dodecafluoro-1,10-decanediyl)bis[3-[(dimethylsilyl)oxy]-1,1,5,5-tetramethyl-, reaction products with 4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoro-1-undecene
15	335-67-1	PFOA - perfluorooctanoic acid
16	45285-51-6	Perfluorooctanoate (conjugate base of the free acid)
PFOA isomer		
17	90480-55-0	Branched perfluorooctanoic acid
18	1882109-81-0	Hexanoic acid, 2,2,3,4,5,5,6,6,6-nonafluoro-3,4- bis(trifluoromethyl)-
19	1882109-80-9	Hexanoic acid, 2,3,3,4,4,5,6,6,6-nonafluoro-2,5- bis(trifluoromethyl)-
20	1882109-79-6	Hexanoic acid, 2,2,3,3,4,5,5,6,6,6-decafluoro-4- (1,1,2,2,2-pentafluoroethyl)-
21	1882109-78-5	Hexanoic acid, 2,2,3,4,4,5,5,6,6,6-decafluoro-3-(1,1,2,2,2-pentafluoroethyl)-
22	1882109-77-4	Pentanoic acid, 2,3,3,4,4,5,5,5-octafluoro-2- (1,1,2,2,3,3,3-heptafluoropropyl)-
23	1882109-76-3	Pentanoic acid, 2,3,3,4,4,5,5,5-octafluoro-2- [1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-
24	1882109-75-2	Pentanoic acid, 2,2,3,5,5,5-hexafluoro-3,4,4- tris(trifluoromethyl)-
25	1882109-74-1	Pentanoic acid, 2,2,4,5,5,5-hexafluoro-3,3,4-tris(trifluoromethyl)-
26	1882109-73-0	Pentanoic acid, 2,3,3,5,5,5-hexafluoro-2,4,4- tris(trifluoromethyl)-
27	1882109-72-9	Pentanoic acid, 2,3,4,5,5,5-hexafluoro-2,3,4- tris(trifluoromethyl)-
28	1882109-71-8	Pentanoic acid, 2,4,4,5,5,5-hexafluoro-2,3,3-tris(trifluoromethyl)-
29	1882109-70-7	Pentanoic acid, 3,3,4,5,5,5-hexafluoro-2,2,4-tris(trifluoromethyl)-
30	1882109-68-3	Pentanoic acid, 2,2,3,4,5,5,5-heptafluoro-3-(1,1,2,2,2-pentafluoroethyl)-4-(trifluoromethyl)-

Appendix 5: PFOA (perfluorooctanoic acid, its salts and its esters)

No.	CAS No. example	Substance name
31	1882109-67-2	Pentanoic acid, 2,2,4,4,5,5,5-heptafluoro-3-(1,1,2,2,2-pentafluoroethyl)-3-(trifluoromethyl)-
32	1882109-66-1	Pentanoic acid, 2,3,4,4,5,5,5-heptafluoro-3-(1,1,2,2,2-pentafluoroethyl)-2-(trifluoromethyl)-
33	1882109-65-0	Pentanoic acid, 2,3,3,4,5,5,5-heptafluoro-2-(1,1,2,2,2-pentafluoroethyl)-4-(trifluoromethyl)-
34	1882109-64-9	Pentanoic acid, 2,3,4,4,5,5,5-heptafluoro-2-(1,1,2,2,2-pentafluoroethyl)-3-(trifluoromethyl)-
35	1882109-63-8	Pentanoic acid, 3,3,4,4,5,5,5-heptafluoro-2-(1,1,2,2,2-pentafluoroethyl)-2-(trifluoromethyl)-
36	1882109-69-4	Pentanoic acid, 3,4,4,5,5,5-hexafluoro-2,2,3-(trifluoromethyl)-
37	1882109-62-7	Butanoic acid, 4,4,4-trifluoro-2,2,3,3-tetrakis(trifluoromethyl)-
38	1882109-61-6	Butanoic acid, 2,3,4,4,4-pentafluoro-2-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-3-(trifluoromethyl)-
39	1882109-60-5	Butanoic acid, 2,3,3,4,4,4-hexafluoro-2-[2,2,2-trifluoro-1,1-bis(trifluoromethyl)ethyl]-
40	1882109-59-2	Butanoic acid, 3,3,4,4,4-pentafluoro-2-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-2-(trifluoromethyl)-
41	1882109-58-1	Butanoic acid, 3,3,4,4,4-pentafluoro-2,2-bis(1,1,2,2,2-pentafluoroethyl)-
42	1812247-20-3	Hexanoic acid, 2,2,4,4,5,5,6,6,6-nonafluoro-3,3-bis(trifluoromethyl)-
43	1812247-19-0	Hexanoic acid, 2,3,3,4,5,5,6,6,6-nonafluoro-2,4-bis(trifluoromethyl)-
44	1812247-18-9	Hexanoic acid, 2,3,4,4,5,5,6,6,6-nonafluoro-2,3-bis(trifluoromethyl)-
45	1812247-17-8	Hexanoic acid, 3,3,4,4,5,5,6,6,6-nonafluoro-2,2-bis(trifluoromethyl)-
46	1192593-79-5	Hexanoic acid, 2,2,3,3,5,5,6,6,6-nonafluoro-4,4-bis(trifluoromethyl)-
47	1144512-36-6	Hexanoic acid, 2,2,3,3,4,5,6,6,6-nonafluoro-4,5-bis(trifluoromethyl)-
48	1144512-35-5	Hexanoic acid, 2,2,3,4,4,5,6,6,6-nonafluoro-3,5-bis(trifluoromethyl)-
49	1144512-34-4	Hexanoic acid, 2,2,3,3,4,4,6,6,6-nonafluoro-5,5-bis(trifluoromethyl)-
50	1144512-18-4	Heptanoic acid, 2,2,3,3,4,5,5,6,6,7,7,7-dodecafluoro-4-(trifluoromethyl)-
51	909009-42-3	Heptanoic acid, 2,2,3,3,4,4,5,6,6,7,7,7-dodecafluoro-5-(trifluoromethyl)-
52	705240-04-6	Heptanoic acid, 2,2,3,4,4,5,5,6,6,7,7,7-dodecafluoro-3-(trifluoromethyl)-
53	207678-51-1	Heptanoic acid, 2,3,3,4,4,5,5,6,6,7,7,7-dodecafluoro-2-(trifluoromethyl)-
54	123116-17-6	Isooctanoic acid, pentadecafluoro-
55	35605-76-6	Hexanoic acid, 2,3,3,4,4,5,5,6,6,6-decafluoro-2-(1,1,2,2,2-pentafluoroethyl)-
56	15166-06-0	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-
PFOA salts (including linear and branched isomers)		
57	90480-56-1	Ammonium salt, linear/branched PFOA (Octanoic acid, pentadecafluoro-, branched,ammonium salt)
58	68141-02-6	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) salt (3:1)
59	98241-25-9	Ethanaminium, N,N,N-triethyl-,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)
60	13058-06-5	Hexanoic acid, 2,3,3,4,4,5,5,6,6,6-decafluoro-2-(1,1,2,2,2- pentafluoroethyl)-, ammonium salt(1:1)
61	1195164-59-0	Hexanoic acid, 2,3,3,4,4,5,5,6,6,6-decafluoro-2-(1,1,2,2,2-pentafluoroethyl)-, sodium salt (1:1)
62	19742-57-5	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-, ammoniumsalt (1:1)

Appendix 5: PFOA (perfluorooctanoic acid, its salts and its esters)

No.	CAS No. example	Substance name
63	61436-04-2	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-, iron salt (1:x)
64	29457-73-6	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-, potassium salt(1:1)
65	18017-22-6	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)- , sodium salt(1:1)
66	15739-82-9	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-, chromium salt(1:x)
67	15715-47-6	Heptanoic acid, 2,2,3,3,4,4,5,5,6,7,7,7-dodecafluoro-6-(trifluoromethyl)-, aluminum salt(3:1)
Fluorotelomer iodides（FTIs）		
68	2043-53-0	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-iodo-
69	2043-54-1	Dodecane,1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-12-iodo-
70	30046-31-2	Tetradecane,1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12-pentacosafluoro-14-iodo-
71	65510-55-6	Hexadecane,1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14-nonacosafluoro-16-iodo-
72	65510-56-7	Undecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9-nonadecafluoro-11-iodo-
73	68188-12-5	Alkyl iodides, C4-20, γ-ω-perfluoro
74	68390-33-0	Alkyl iodides, C10-12, γ-ω-perfluoro
Fluorotelomer alcohol（FTOHs）		
75	60699-51-6	1-Hexadecanol,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluoro-
76	39239-77-5	1-Tetradecanol,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluoro-
77	865-86-1	1-Dodecanol,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-
78	678-39-7	1-Decanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-
Fluorotelomer acrylates and methacrylates（FTACs and FTMACs）		
79	16083-78-6	2-Propenoic acid,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,17,17,17-octacosafluoro-2-hydroxy-16-(trifluoromethyl)heptadecyl ester
80	4980-53-4	2-Propenoic acid, 2-methyl-,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,16,16,16-nonacosafluorohexadecylester
81	6014-75-1	2-Propenoic acid, 2-methyl-,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafluorotetradecyl ester
82	16083-87-7	2-Propenoic acid,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,15,15,15-tetracosafluoro-2-hydroxy-14-(trifluoromethyl)pentadecyl ester
83	52956-82-8	2-Propenoic acid,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,14,14,14-tetracosafluoro-13-(trifluoromethyl)tetradecyl ester
84	74256-14-7	2-Propenoic acid, 2-methyl-,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,12,12,12-eicosafluoro-11-(trifluoromethyl)dodecyl ester
85	74256-15-8	2-Propenoic acid, 2-methyl-,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,14,14,14-tetracosafluoro-13-(trifluoromethyl)tetradecyl ester

Appendix 5: PFOA (perfluorooctanoic acid, its salts and its esters)

No.	CAS No. example	Substance name
86	17741-60-5	2-(Perfluorodecyl) ethyl acrylate, 2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester
87	2144-54-9	2-(Perfluorodecyl) ethyl methacrylate, 2- Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluorododecyl ester
88	27905-45-9	8:2 Fluorotelomer acrylate, 2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester
89	1996-88-9	8:2 Fluorotelomer methacrylate, 2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl ester
90	85631-54-5	2-Propenoic acid, γ-ω-perfluoro-C8-14-alkyl esters
91	91615-22-4	2-Propenoic acid, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,
92	94158-63-1	2-Propenoic acid,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14, 15,15,16,16,17,18,18,18-dotriacontafluoro-17-(trifluoromethyl)octadecyl ester
93	94158-64-2	2-Propenoic acid, 2-methyl-,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13, 13,14,14,15,16,16,16-octacosafluoro-15-(trifluoromethyl)hexadecyl ester
94	94158-65-3	2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13, 13,14,14,15,15,16,16,17,18,18,18-dotriacontafluoro-17-(trifluoromethyl)octadecylester
Perfluoroalkyl halides (including straight chain and branched isomers)		
95	507-63-1	Perfluorooctyl iodide
96	307-50-6	Undecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11-tricosafluoro-11-iodo-
97	307-60-8	Dodecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12-pentacosafluoro-12-iodo-
98	307-63-1	Tetradecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13, 14,14-nonacosafluoro-14-iodo-
99	335-79-5	Pentadecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13, 14,14,15,15-hentriacontafluoro-15-iodo
100	376-04-5	Tridecane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13-heptacosafluoro-13-iodo-
101	423-62-1	Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heneicosafluoro-10-iodo-
102	558-97-4	Nonane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9-nonadecafluoro-9-iodo-
103	677-93-0	Decane, 1,1,1,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-eicosafluoro-10-iodo-2-(trifluoromethyl)-
104	3248-61-1	Dodecane, 1,1,1,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12, 12-tetracosafluoro-12-iodo-2-(trifluoromethyl)-
105	3248-63-3	Tetradecane, 1,1,1,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13, 14,14-octacosafluoro-14-iodo-2-(trifluoromethyl)-
106	307-43-7	Decane, 1-bromo-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-
107	90622-71-2	Alkyl iodides, C6-18, perfluoro
Fluorotelomer Elfin (FTOs)		
108	21652-58-4	8:2 Fluorotelomer olefin
109	30389-25-4	1-Dodecene,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-

Appendix 5: PFOA (perfluorooctanoic acid, its salts and its esters)

Other PFOA related compounds

No.	CAS No. example	Substance name
110	125476-71-3	Silicic acid (H4SiO4), disodium salt, reaction products with chlorotrimethylsilane and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluoro-1-decanol
111	161045-59-6	Poly[[1,3-bis(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-1,3:1,3-disiloxanediylidene]-1,3-
112	165320-75-2	1,5-Trisiloxanediol, 3-(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-1,1,3,5,5-pentamethyl- (9CI)
113	83048-65-1	Silane, (3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)trimethoxy-
114	78560-44-8	Silane, trichloro(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)-

※ The information above is an example. Please check the latest list of GADSL (link below).
https://www.gadsl.org/

Appendix 6: Polycyclic aromatic hydrocarbons (PAH)

No.	CAS No.	Substance name	Substance
1	50-32-8	Benzo (a) pyrene (BaP)	Benzo[a]pyrene
2	192-97-2	Benzo (e) pyrene (BeP)	Benzo[e]pyrene
3	56-55-3	Benzo (a) anthracene (BaA)	Benz[a]anthracene
4	218-01-9	Chrysene (CHR)	Chrysene
5	205-99-2	Benzo (b) fluoranthene (BbFA)	Benzo(e)acephenanthrylene
6	205-82-3	Benzo (j) fluoranthene (BjFA)	Benzo[j]fluoranthene
7	207-08-9	Benzo (k) fluoranthene (BkFA)	Benzo(k)fluoranthene
8	53-70-3	Dibenzo (a, h) anthracene (DBAhA)	Dibenz[a,h]anthracene

1. Basic analysis

Regarding 10 RoHS regulated substances (cadmium, lead, mercury, hexavalent chromium, PBB, PBDE, DEHP, DBP, BBP, DIBP), please measure by referring to the recommended analysis method.

Perform fluorescent X-ray analysis on cadmium, lead, mercury, total chromium, and bromine.
For cadmium and lead, please submit the analysis data by ICP-AES (ICP-OES), ICP-MS, etc.
For mercury, total chromium, and bromine, if the X-ray fluorescence analysis results are below the quantitation limit, subsequent analysis is not necessary.

Note) Please be sure to submit the analysis data of X-ray fluorescence analysis, the ICP data of lead and cadmium, and the measurement results of phthalates as evidence of non-use guarantee.

Note) For application equipment, supplier evaluation is carried out once a year based on the "MS5-1811-001 Customer Periodic Evaluation Check Sheet (for labor saving)". Based on the evaluation result, 3B will instruct the evidence of the non-use guarantee from the supplier, either the non-use certificate, the material certificate, or the analysis result based on the basic analysis, so please submit it.

Outline of recommended analytical methods

Object substances	Analytical methods
Cadmium, lead, mercury, total chromium, bromine	X-ray fluorescence analysis
Cadmium and its compound	ICP-AES (ICP-OES), ICP-MS
Lead and its compound	ICP-AES (ICP-OES), ICP-MS
Mercury and its compound	Reduction vaporizing atomic absorption method
Total chromium	ICP-AES (ICP-OES), ICP-MS
Hexavalent chromium compounds	Diphenylcarbazide absorption spectrometry
Bromine	ICP-AES (ICP-OES), ICP-MS, Combustion atomic absorption spectrometry
Specific organic brominated fire retardant (PBB, PBDE)	GC-MS
Phthalates (DEHP, DBP, BBP, DIBP)	GC-MS

*Reference (In case that the content is unknown, it is possible to analyze using the following methods)

Object substances	Analytical methods
Specific organic tin compounds	GC-MS
PCB (polychlorobiphenyl)	HRGCMS
Short chain type paraffin chloride (C 10 to 13)	HRGCMS
Asbestos	XRD
Azo dye and pigment which form specific amine	GC-MS
Short chain chlorinated paraffins (C10 to 13)	HRGCMS
Specific amine compounds	GC-MS
Ozone depleting substances	GC-MS

HRGCMS:	High-resolution gas chromatograph mass spectrometry
GC-MS:	Gas chromatograph mass spectrometry
ICP-AES (ICP-OES):	Inductively coupled plasma atomic emission. Spectrometry (Inductively coupled plasma optical emission spectrometry)
ICP-MS:	Inductively coupled plasma source mass spectrometry
GC:	Gas chromatography
IC:	Ion chromatography
XRD:	X-ray diffraction method
AAS:	Atomic absorption spectrometry

Cadmium and its compounds
Permissible concentration: less than 100 ppm
Measurement method: (1) Pretreatment method Regarding the recommended pretreatment method, the following four types are mainly mentioned. 1. Ashing method in the presence of sulfuric acid 2. Pressurized acid decomposition method (microwave decomposition method) in a closed container 3. Acid decomposition method using nitric acid, hydrogen peroxide, and hydrochloric acid 4. A wet decomposition method using sulfuric acid, nitric acid, or hydrogen peroxide solution is used. And so on. * In all of the above, if a precipitate (insoluble matter) is generated, completely dissolve it into a solution by some method. (2) Measuriement method The following two types of measurement methods are mainly recommended. 1. Inductive coupling-plasma emission spectroscopy (ICP-AES, ICP-OES) 2. Inductively coupled-plasma mass spectrometry (ICP-MS) In addition to the above, if the combination of pretreatment and measurement method can guarantee that the lower limit of cadmium quanitity is less than 5 ppm, it is acceptable.

Lead and its compounds

Permissible concentration: less than 1000 ppm

Measurement method:

(1) Pretreatment method

The recommended pretreatment methods are mainly the following four types.

1. Ashing method in the presence of sulfuric acid
2. Pressurized acid decomposition method (microwave decomposition method) in a closed container
3. Acid decomposition method using nitric acid, hydrogen peroxide, and hydrochloric acid
4. Wet decomposition method with sulfuric acid and hydrogen peroxide

And so on.

* In all of the above, if a precipitate (insoluble matter) is generated, completely dissolve it by some method to form a solution.

(2) Measuring method

The following two types of measurement methods are mainly recommended.

1. Inductive coupling-plasma emission spectroscopy (ICP-AES, ICP-OES)
2. Inductively coupled-plasma mass spectrometry (ICP-MS)

In addition to the above, if the combination of pretreatment and measurement method can guarantee that the lower limit of lead quanitity is less than 30 ppm, it is acceptable.

Mercury and its compounds
Permissible concentration: less than 1000 ppm
Measurement method: (1) Pretreatment method The recommended pretreatment methods are mainly the following three types. 1. Pressurized acid decomposition method (microwave decomposition method) in a closed container 2. Heating vaporization-cold atomic absorption method 3. Wet decomposition method with sulfuric acid and nitric acid using a decomposition flask equipped with a reflux condenser (Kjeldahl method). If a precipitate occurs, dissolve it by some method. (2) Measuring method The following two types of measurement methods are mainly recommended. 1. Inductively coupled-plasma emission spectroscopy with hydrogenation generator (ICP-AES, ICP-OES) 2. Inductively coupled-plasma mass spectrometry (ICP-MS) In addition to the above, if the combination of pretreatment and measurement method can guarantee that the lower limit of mercury quanitity is less than 5 ppm, it is acceptable.

Hexavalent chromium compound
The total chromium content is measured by the following method, and when the total chromium content is less than 1000 ppm, the measurement of hexavalent chromium is unnecessary.

Total chrome
Permissible concentration: less than 1000 ppm
Measurement method: (1) Pretreatment method The recommended pretreatment methods are mainly the following four types. 1. Ashing method in the presence of sulfuric acid 2. Pressurized acid decomposition method (microwave decomposition method) in a closed container 3. Acid decomposition method using nitric acid, hydrogen peroxide, and hydrochloric acid 4. Wet decomposition method with sulfuric acid, nitric acid, hydrogen peroxide And so on. * In all of the above, if a precipitate (insoluble matter) is generated, completely dissolve it by some method to form a solution. (2) Measuring method The following two types of measurement methods are mainly recommended. 1. Inductively coupled-plasma emission spectroscopy (ICP-AES, ICP-OES) 2. Inductively coupled-plasma mass spectrometry (ICP-MS) In addition to the above, if combination of pretreatment and measurement method can guarantee that the lower limit of quantification of chromium is less than 5 ppm, it is acceptable.

Hexavalent chromium compound
Permissible concentration: less than 1000 ppm
Measurement method: (1) Pretreatment method Regarding the recommended pretreatment, there are mainly the following two types of methods. 1. Phosphate buffer extraction method in inert gas 2. Elution method (hot water extraction method, alkali extraction method) (2) Measuring method The following are the recommended measurement methods. 1. Diphenylcarbazide absorption method In addition to the above, if the combination of pretreatment and measurement method can guarantee that the lower limit of hexavalent chromium quanitity is less than 5 ppm, it is acceptable.

Bromine（PBB・PBDE）

The total bromine content is measured by ICP-AES (ICP-OES), ICP-MS, combustion absorption atomic absorption method, etc. If the total bromine content is less than 1000ppm, PBB / PBDE measurement is not required.

PBB・PBDE
Permissible concentration: less than 1000 ppm
Measurement method: (1) Pretreatment method The following methods are mainly mentioned as the recommended pretreatment method. 1. Solvent extraction method (2) Measuring method The recommended measuring methods mainly include the following methods. 1. GC-MS method In addition to the above, if the combination of pretreatment and measurement method can guarantee that the lower limit of PBB / PBDE quanitity is less than 100 ppm, it is acceptable.

Phthalates（DEHP,DBP,BBP,DIBP）

Permissible concentration: Less than 1000ppm for each typeor less than 1000ppm for total of 4 types

Measurement method:

(1) Pretreatment method

Decide whether to adopt the screening method or the verification method.

・Measurement by thermal decomposition method (Py-GC / MS) in screening method

・As a verification method, Soxhlet extraction-GC / MS method or reprecipitation-GC / MS method

When the screening method is adopted, it is judged based on the quantitative value whether inclusion or non-inclusion or reanalysis by the verification method is necessary. As for the judgment threshold value, it is judged that the quantitative value is 0.5 times the maximum allowable concentration, that is, 500 ppm, it is not contained, and the quantitative value is 1.5 times the maximum allowable concentration, that is, 1,500 ppm, that it is contained. On the other hand, if the concentration is between 500 and 1,000 ppm, the necessity of re-examination by the verification method is judged in consideration of the characteristics peculiar to the screening device. If it is 1,000ppm to 1,500ppm, re-inspect it by the verification method.