



# Test Report

No.: ETR24500383

Date: 13-May-2024

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JX METALS CORPORATION, ISOHARA WORKS  
187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

### The following sample(s) was/were submitted and identified by the applicant as:

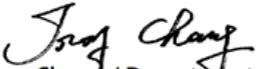
Sample Submitted By : NIKKO METALS TAIWAN CO., LTD.  
Sample Name : LSI TARGET  
Style/Item No. : Cu

=====  
Sample Receiving Date : 03-May-2024  
Testing Period : 03-May-2024 to 13-May-2024

Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).  
(2) As requested by the client, the risk of specific PFAS in the selected sample is evaluated. The total amounts of evaluated PFAS are 312 items, concluding 104 tested items and 208 listed items (see PFAS Remark).  
(3) Please refer to next pages for the other item(s).

Test Results : Please refer to following pages.

Conclusion : (1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

  
Troy Chang / Department Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei



PIN CODE: 62B3586A

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187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

## Test Part Description

No.1 : COPPER COLORED METAL

## Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	µg/cm <sup>2</sup>	0.1	n.d.	-
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
<b>Sum of PBBs</b>		mg/kg	-	n.d.	1000
Monobromodiphenyl ether		mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether	mg/kg	5	n.d.	-	
<b>Sum of PBDEs</b>	mg/kg	-	n.d.	1000	

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Bismuth (Bi) (CAS No.: 7440-69-9)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Phosphorus (P) (CAS No.: 7723-14-0)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Selenium (Se) (CAS No.: 7782-49-2)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
<b>PFAS</b>					
<b>PFHxA and its salts</b>					
Perfluorohexane acid and its salts (PFHxA and its salts) (CAS No.: 307-24-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>PFHxA related compounds</b>					
1H,1H,2H,2H-Perfluoro-1-octanol (6:2FTOH) (CAS No.: 647-42-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorooctylacrylate (6:2FTA) (CAS No.: 17527-29-6)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorooctyl methacrylate (6:2 FTMAC) (CAS No.: 2144-53-8)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorooctanesulphonic acid and its salts (6:2 FTS and its salts) (CAS No.: 27619-97-2 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-iodooctane (6:2 FTI) (CAS No.: 2043-57-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
<b>PFHxS and its salts</b>					
Perfluorohexane sulfonate and its salts (PFHxS and its salts) (CAS No.: 355-46-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>PFHxS related compounds</b>					
N-Methylperfluoro-1-hexanesulfonamide (N-Me-FHxSA) (CAS No.: 68259-15-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorohexane sulfonamide (PFHxSA) (CAS No.: 41997-13-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-[3-(dimethylamino)propyl]tridecafluoro hexanesulphonamide (N-AP-FHxSA) (CAS No.: 50598-28-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
2-[Methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl acrylate (N-MeFHSEA) (CAS No.: 67584-57-0)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
2-Propenoic acid, 2-methyl-, 2-[methyl[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl]amino]ethyl ester (CAS No.: 67584-61-6)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2-Propenoic acid, 2-methyl-, 2-[ethyl[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl]amino]ethyl ester (CAS No.: 67906-70-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1-Hexanesulfonamide, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-N-(2-hydroxyethyl)-N-methyl-(MeFHxSE) (CAS No.: 68555-75-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Glycine, N-ethyl-N-[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl] and its salts (EtFHxSAA and its salts) (CAS No.: 68957-32-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroheptane acid and its salts (PFHpA and its salts) (CAS No.: 375-85-9 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
7H-Dodecanefluoroheptane acid and its salts (HPFHpA and its salts) (CAS No.: 1546-95-8 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroheptane sulfonate and its salts (PFHpS and its salts) (CAS No.: 375-92-8 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>PFOS and its salts</b>					
Perfluorooctane sulfonates and its salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
<b>PFOS related compounds</b>					
N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (CAS No.: 4151-50-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Methyl-Perfluorooctanesulfonamide (N-Me-FOSA) (CAS No.: 31506-32-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Ethyl-Perfluorooctanesulfonamidoethanol (N-Et-FOSE alcohol) (CAS No.: 1691-99-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Methyl-Perfluorooctanesulfonamidoethanol (N-Me-FOSE alcohol) (CAS No.: 24448-09-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctanesulfonamide and its salts (PFOSA and its salts) (CAS No.: 754-91-6 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>PFOA and its salts</b>					
Perfluorooctanoic acid and its salts (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>PFOA related compounds</b>					
Methyl perfluorooctanoate (Me-PFOA) (CAS No.: 376-27-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Ethyl perfluorooctanoate (Et-PFOA) (CAS No.: 3108-24-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluoro-1-iodooctane (PFOI) (CAS No.: 507-63-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
3-Perfluoroheptyl propanoic acid (7:3 FTCA) (CAS No.: 812-70-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecanesulfonic acid and its salts (8:2 FTS and its salts) (CAS No.: 39108-34-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH) (CAS No.: 678-39-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA) (CAS No.: 27905-45-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA) (CAS No.: 1996-88-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H-Perfluorodecane acid and its salts (H2PFDA and its salts) (CAS No.: 27854-31-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecyl iodide (8_2 FTI) (CAS No.: 2043-53-0)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltriethoxysilane (8:2 FTSi(OC2H5)3) (CAS No.: 101947-16-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H,3H,3H-Perfluoroundecanoic Acid and its salts (4HPFUa and its salts) (CAS No.: 34598-33-9 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H-Heptadecafluoro-1-decene (PFDE) (CAS No.: 21652-58-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate and its salts (8_2diPAP and its salts) (CAS No.: 678-41-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>C9-C20 PFCAs its salts and related compounds</b>					
1H,1H,2H,2H-Perfluorodecanesulfonic acid and its salts (8:2 FTS and its salts) (CAS No.: 39108-34-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH) (CAS No.: 678-39-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA) (CAS No.: 27905-45-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA) (CAS No.: 1996-88-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H-Perfluorodecane acid and its salts (H2PFDA and its salts) (CAS No.: 27854-31-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecyl iodide (8_2 FTI) (CAS No.: 2043-53-0)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltriethoxysilane (8:2 FTSi(OC2H5)3) (CAS No.: 101947-16-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H,3H,3H-Perfluoroundecanoic Acid and its salts (4HPFUnA and its salts) (CAS No.: 34598-33-9 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H-Heptadecafluoro-1-decene (PFDE) (CAS No.: 21652-58-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate and its salts (8_2diPAP and its salts) (CAS No.: 678-41-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorononan-1-oic acid and its salts (PFNA and its salts) (CAS No.: 375-95-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoro-3,7-dimethyloctanoic Acid (PF-3,7-DMOA) (CAS No.: 172155-07-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecane acid and its salts (PFDA and its salts) (CAS No.: 335-76-2 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroundecanoic acid and its salts (PFUnDA and its salts) (CAS No.: 2058-94-8 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Perfluorododecanoic acid and its salts (PFDoDA and its salts) (CAS No.: 307-55-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecane sulfonate and its salts (PFDS and its salts) (CAS No.: 335-77-3 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Pentacosafuorotridecanoic acid and its salts (PFTrDA and its salts) (CAS No.: 72629-94-8 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorotetradecanoic acid and its salts (PFTDA and its salts) (CAS No.: 376-06-7 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2FTOH) (CAS No.: 865-86-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecylacrylate (10:2FTA) (CAS No.: 17741-60-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecyl methacrylate (10:2 FTMA) (CAS No.: 2144-54-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-perfluorotetradecan-1-ol (12:2 FTOH) (CAS No.: 39239-77-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS) (CAS No.: 120226-60-0)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorododecyl iodide (10:2 FTI) (CAS No.: 2043-54-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorotetradecyl iodide (12:2 FTI) (CAS No.: 30046-31-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorononane sulfonic acid and its salts (PFNS and its salts) (CAS No.: 68259-12-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Perfluoroundecane sulfonic acid and its salts (PFUnDS and its salts) (CAS No.: 749786-16-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorododecane sulfonic acid and its salts (PFDoDS and its salts) (CAS No.: 79780-39-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorotridecane sulfonic acid and its salts (PFTrDS and its salts) (CAS No.: 791563-89-8 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
10:2 Fluortelomerphosphatediester (10:2 diPAP) (CAS No.: 1895-26-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
Perfluorododecyl iodide (PFDoDI) (CAS No.: 307-60-8)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorodecyl iodide (PFDI) (CAS No.: 423-62-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluoropentadecanoic acid and its salts (PFPeDA and its salts, C15) (CAS No.: 141074-63-7 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
Perfluorohexadecanoic acid and its salts (PFHxDA and its salts, C16) (CAS No.: 67905-19-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctadecanoic acid and its salts (PFODA and its salts, C18) (CAS No.: 16517-11-6 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
<b>Other PFAS</b>					
Perfluorobutane acid and its salts (PFBA and its salts) (CAS No.: 375-22-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorobutane sulfonate and its salts (PFBS and its salts) (CAS No.: 375-73-5 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorobutane sulfon amides (CAS No.: 30334-69-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-methylbutane-1-sulphonamide (PFBS-NC3H8O) (CAS No.: 34454-97-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorohexyl methacrylate (4:2 FTMA) (CAS No.: 1799-84-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluoropentane acid and its salts (PFPA and its salts) (CAS No.: 2706-90-3 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoro-3-methoxypropanoic acid (PFMPA) (CAS No.: 377-73-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoro-4-methoxybutanoic acid (PFMBA) (CAS No.: 863090-89-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA) (CAS No.: 151772-58-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
4,8-Dioxa-3H-perfluorononanoic acid and its salts (ADONA and its salts) (CAS No.: 919005-14-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-hexanol (4:2FTOH) (CAS No.: 2043-47-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid and its salts (HFPO-DA and its salts) (CAS No.: 13252-13-6 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorohexanesulfonic acid and its salts (4:2 FTS and its salts) (CAS No.: 757124-72-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctane sulfonamidoacetic acid (FOSAA) (CAS No.: 2806-24-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA) (CAS No.: 2355-31-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA) (CAS No.: 2991-50-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoropentane sulfonic acid and its salts (PFPeS and its salts) (CAS No.: 2706-91-4 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
3-Perfluoropropyl propanoic acid (3:3 FTCA) (CAS No.: 356-02-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2-Perfluorohexyl ethanoic acid (6:2 FTCA) (CAS No.: 53826-12-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
3-Perfluoropentyl propanoic acid (5:3 FTCA) (CAS No.: 914637-49-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA) (CAS No.: 113507-82-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS) (CAS No.: 756426-58-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) (CAS No.: 763051-92-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2-(N-ethylperfluorooctanesulfamido)ethyl acrylate (EtFOSAC) (CAS No.: 423-82-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorooctyl triethoxysilane (POTS) (CAS No.: 51851-37-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
11H-Perfluoroundecanoic acid and its salts (11H-PFUnDA and its salts) (CAS No.: 1765-48-6 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
Pentafluoropropionate acid and its salts (PFPrA and its salts) (CAS No.: 422-64-0 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluorodecyltrichlorosilane (CAS No.: 78560-44-8)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltrimethoxysilane (CAS No.: 83048-65-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.				
1H,1H,2H,2H-Perfluorooctyltrichlorosilane (CAS No.: 78560-45-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecylmethyldichlorosilane (CAS No.: 3102-79-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H-Perfluoro-2-decenoic acid (8:2 FTUCA) (CAS No.: 70887-84-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2H-Perfluoro-2-octenoic acid (6:2 FTUCA) (CAS No.: 70887-88-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2H-Perfluoro-2-dodecenoic acid (10:2 FTUCA) (CAS No.: 70887-94-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2-Perfluorodecyl ethanoic acid (10:2 FTCA) (CAS No.: 53826-13-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
6:6 Perfluorophosphinic acid (6:6 PFPi) (CAS No.: 40143-77-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
6:8 Perfluorophosphinic acid (6:8 PFPi) (CAS No.: 610800-34-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
8:8 Perfluorophosphinic acid (8:8 PFPi) (CAS No.: 40143-79-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorohexyl iodide (PFHxl) (CAS No.: 355-43-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorohexyl ethylene (PFHxE) (CAS No.: 25291-17-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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## Note :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected ( Less than MDL)
4. "-" = Not Regulated
5. (#2) =
  - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13  $\mu\text{g}/\text{cm}^2$ . The sample coating is considered to contain Cr(VI).
  - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10  $\mu\text{g}/\text{cm}^2$ ). The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10  $\mu\text{g}/\text{cm}^2$  and 0.13  $\mu\text{g}/\text{cm}^2$  is considered to be inconclusive - unavoidable coating variations may influence the determination.
6. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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**PFAS Remark :**

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Group Name	Substance Name	CAS No.
PFBA, its salts	Perfluorobutane acid (PFBA)	375-22-4
	Ammonium perfluorobutanoate (PFBA-NH <sub>4</sub> )	10495-86-0
	Sodium perfluorobutanoate (PFBA-Na)	2218-54-4
	Potassium heptafluorobutanoate (PFBA-K)	2966-54-3
	Silver perfluorobutanoate (PFBA-Ag)	3794-64-7
	Lithium perfluorobutanoate (PFBA-Li)	4146-76-3
	Heptafluorobutanoic acid-piperazine (1:1)	375-04-2
	Perfluorobutanoate (anion)	45048-62-2
PFBS, its salts & derivatives	Perfluorobutane sulfonate (PFBS)	375-73-5
	1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, sodium salt (1:1) (PFBS-Na)	60453-92-1
	Lithium perfluorobutanesulfonate (PFBS-Li)	131651-65-5
	Magnesium perfluorobutanesulfonate (PFBS-Mg)	507453-86-3
	Perfluorobutane Sulfonate K-salt (PFBS-K)	29420-49-3
	Perfluorobutane sulfonyl fluoride (PFBS-F)	375-72-4
	Tetraethylammonium perfluorobutanesulfonate (PFBS-N(CH <sub>3</sub> CH <sub>2</sub> ) <sub>4</sub> )	25628-08-4
	Triphenylsulfanium perfluorobutane sulfonate (TPS-PFBS)	144317-44-2
	Dimethyl(phenyl)sulfanium perfluorobutane sulfonate	220133-51-7
	Ammonium 1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonate (PFBS-NH <sub>4</sub> )	68259-10-9
	Nonafluorobutanesulfonic acidHydrate	59933-66-3
	Tetrabutyl-phosphonium nonafluoro-butane-1-sulfonate	220689-12-3
	Morpholinium perfluorobutanesulfonate	503155-89-3
	Nonafluoro-1-butanesulfonyl chloride (PFBS-Cl)	2991-84-6
	Bis(4-tert-butylphenyl)iodonium perfluoro-1-butanesulfonate (PFBS-I(C <sub>6</sub> H <sub>4</sub> ) <sub>2</sub> (C <sub>4</sub> H <sub>9</sub> ) <sub>2</sub> )	194999-85-4

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JX METALS CORPORATION, ISOHARA WORKS

187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Group Name	Substance Name	CAS No.
PFBS, its salts & derivatives	1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonic acid, compound with 2,2'-iminodiethanol (1:1) (PFBS-NH(C <sub>2</sub> H <sub>5</sub> O) <sub>2</sub> )	70225-18-2
	1-(4-butoxy-1-naphthyl)tetrahydrothiophenium nonafluorobutane-1-sulfonate (PFBS-SC <sub>18</sub> H <sub>23</sub> O)	209482-18-8
	Tetrabutylammonium nonafluorobutanesulfonate ((PFBS-N(C <sub>4</sub> H <sub>9</sub> ) <sub>4</sub> ))	108427-52-7
	Diphenyliodonium nonafluorobutane-1-sulfonate((PFBS-I(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> ))	194999-82-1
	Sulfonium, tris[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	241806-75-7
	Sulfonium, (4-cyclohexylphenyl)diphenyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	425670-64-0
	Thiophenium, tetrahydro-1-(1-methyl-1H-indol-3-yl)-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	867373-18-0
	Pyridinium, 1-ethyl-3-methyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	1015420-87-7
	1H-Imidazolium, 1-methyl-3-octyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	905972-83-0
	1H-Imidazolium, 3-hexyl-1-methyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	1001557-05-6
	2-Propanaminium, N,N-dimethyl-N-(1-methylethyl)-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	374571-81-0
	Sulfonium, [4-[2-(1,1-dimethylethoxy)-2-oxoethoxy]phenyl]diphenyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	857285-80-4
	1-Butanaminium, N,N-dibutyl-N-methyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	124472-66-8
	1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, zinc salt (2:1) (PFBS-Zn)	502457-69-4
	1-Pentanaminium, N,N,N-tripropyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1)	56773-55-8
	Perfluorobutanesulfonic acid tetramethylammonium salt (PFBS-N(CH <sub>3</sub> ) <sub>4</sub> )	25628-17-5
	1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, 1,1'-anhydride	36913-91-4
Perfluorobutane sulfonate (anion)	45187-15-3	

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JX METALS CORPORATION, ISOHARA WORKS

187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Group Name	Substance Name	CAS No.
PFPA, its salts	Perfluoropentane acid (PFPA)	2706-90-3
	Sodium perfluoropentanoate (PFPA-Na)	2706-89-0
	Potassium perfluoropentanoate (PFPA-K)	336-23-2
	Ammonium perfluoropentanoate (PFPA-NH <sub>4</sub> )	68259-11-0
	Lithium perfluoropentanoate (PFPA-Li)	198482-22-3
	Silver perfluoropentanoate (PFPA-Ag)	2795-30-4
	Perfluoropentanoate (anion)	45167-47-3
PFHxA, its salts & derivatives	Perfluorohexane acid (PFHxA)	307-24-4
	Ammonium perfluorohexanoate (PFHxA-NH <sub>4</sub> )	21615-47-4
	Sodium perfluorohexanoate (PFHxA-Na)	2923-26-4
	Potassium perfluorohexanoate (PFHxA-K)	3109-94-2
	Perfluorohexanoyl fluoride (PFHxA-F)	355-38-4
	Silver perfluorohexanoate (PFHxA-Ag)	336-02-7
	Lithium perfluorohexanoate (PFHxA-Li)	90430-61-8
	Perfluorohexanoic anhydride	308-13-4
	Hexanoic acid, undecafluoro-, compd. with piperazine (2:1) (8Cl,9Cl)	423-47-2
	Perfluorohexanoate (anion)	92612-52-7
6:2 FTS, its salts	1H,1H,2H,2H-Perfluorooctanesulphonic acid (6:2 FTS)	27619-97-2
	Sodium 1H,1H,2H,2H-Perfluorooctanesulfonate (6:2 FTS-Na)	27619-94-9
	Potassium 1H,1H,2H,2H-Perfluorooctanesulfonate (6:2 FTS-K)	59587-38-1
	Ammonium 1H,1H,2H,2H-Perfluorooctanesulfonate (6:2 FTS-NH <sub>4</sub> )	59587-39-2
	1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8-tridecafluoro-, barium salt (2:1) (6:2 FTS-Ba)	1807944-82-6
PFHxS, its salts & derivatives	Perfluorohexane sulfonate (PFHxS)	355-46-4
	Perfluorohexanesulfonate Na-salt (PFHxS-Na)	82382-12-5
	Perfluorohexanesulfonate K-salt (PFHxS-K)	3871-99-6
	Ammonium perfluorohexanesulfonate (PFHxS-NH <sub>4</sub> )	68259-08-5
	Perfluorohexanesulfonate Li-salt (PFHxS-Li)	55120-77-9
	Perfluorohexanesulfonate Zn-salt (PFHxS-Zn)	70136-72-0
	Perfluorohexanesulfonate sulfonyl fluoride (PFHxS-F)	423-50-7

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Group Name	Substance Name	CAS No.
PFHxS, its salts & derivatives	Phosphonium, triphenyl(phenylmethyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	1000597-52-3
	N,N,N-tributylbutan-1-aminium tridecafluorohexane-1-sulfonate	108427-54-9
	N,N,N-triethylethanaminium tridecafluorohexane-1-sulfonate (1:1)	108427-55-0
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, compd. With pyrrolidine (1:1)	1187817-57-7
	Ethanaminium, N-[4-[[4-(diethylamino)phenyl][4-(ethylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-N-ethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	1310480-24-0
	Methanaminium, N-[4-[[4-(dimethylamino)phenyl][4-(ethylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-N-methyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	1310480-27-3
	Methanaminium, N-[4-[[4-(dimethylamino)phenyl][4-(phenylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-N-methyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	1310480-28-4
	Beta-Cyclodextrin, compd. with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid ion(1-) (1:1)	1329995-45-0
	Gamma-Cyclodextrin, compd. with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid ion(1-) (1:1)	1329995-69-8
	Sulfonium, triphenyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	144116-10-9
	Quinolinium, 1-(carboxymethyl)-4-[2-[4-[4-(2,2-diphenylethenyl)phenyl]-1,2,3,3a,4,8b-hexahydrocyclopent[b]indol-7-yl]ethenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	1462414-59-0
	Iodonium, diphenyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	153443-35-7
	Methanaminium, N,N,N-trimethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid (1:1)	189274-31-5

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Group Name	Substance Name	CAS No.
PFHxS, its salts & derivatives	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, compd.with 2-methyl-2-propanamine (1:1)	202189-84-2
	Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	213740-81-9
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, gallium salt (9Cl)	341035-71-0
	Sulfonium, bis(4-methylphenyl)phenyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	341548-85-4
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, scandium(3+) salt (3:1) (PFHxS-Sc)	350836-93-0
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, neodymium(3+) salt (3:1) (PFHxS-Nd)	41184-65-0
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, yttrium(3+) salt (3:1) (PFHxS-Y)	41242-12-0
	Sulfonium, (thiodi-4,1-phenylene)bis[diphenyl]-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid (1:2)	421555-73-9
	Iodonium, bis[4-(1,1-dimethylpropyl)phenyl]-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid	421555-74-0
	Sulfonium, tris[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	425670-70-8
	Tridecafluorohexanesulphonic acid, compound with 2,2'-iminodiethanol (1:1)	70225-16-0
	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, compd. with N,N-diethylethanamine (1:1)	72033-41-1
	Iodonium, bis[(1,1-dimethylethyl)phenyl]-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid (1:1) (9Cl)	866621-50-3
	Sulfonium, (4-methylphenyl)diphenyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	910606-39-2
	Sulfonium, [4-[(2-methyl-1-oxo-2-propen-1-yl)oxy]phenyl]diphenyl-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	911027-68-4

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Group Name	Substance Name	CAS No.
PFHxS, its salts & derivatives	1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-, cesium salt (1:1) (PFHxS-CsH)	92011-17-1
	Dibenzo[k,n][1,4,7,10,13]tetraoxathiacyclopentadecinium, 19-[4-(1,1-dimethylethyl)phenyl]-6,7,9,10,12,13-hexahydro-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1)	928049-42-7
	Perfluorohexylsulfonyl chloride (PFHxS-Cl)	55591-23-6
	Sulfonium, [4-[(2-methyl-1-oxo-2-propenyl)oxy]phenyl]diphenyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonic acid (1:1), polymer with 2-ethyltricyclo[3.3.1.1 <sup>3,7</sup> ]dec-2-yl 2-methyl-2-propenoate, 3-hydroxytricyclo[3.3.1.1 <sup>3,7</sup> ]dec-1-yl 2-methyl-2-propenoate and tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate	911027-69-5
	Perfluorohexane sulfonate (anion)	108427-53-8
EtFHxSAA, its salts	Glycine, N-ethyl-N-[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl] (EtFHxSAA)	68957-32-4
	Potassium N-ethyl-n-[(tridecafluorohexyl)sulfonyl]glycinate (EtFHxSAA-K)	67584-53-6
	Sodium N-ethyl-N-((tridecafluorohexyl)sulphonyl)glycinate (EtFHxSAA-Na)	68555-70-4
PFHpA, its salts	Perfluoroheptane acid (PFHpA)	375-85-9
	Sodium perfluoroheptanoate (PFHpA-Na)	20109-59-5
	Potassium perfluoroheptanoate (PFHpA-K)	21049-36-5
	Ammonium perfluoroheptanoate (PFHpA-NH <sub>4</sub> )	6130-43-4
	Cesium perfluoroheptanoate (PFHpA-Cs)	171198-24-6
	Silver perfluoroheptanoate (PFHpA-Ag)	424-05-5
	Lithium perfluoroheptanoate (PFHpA-Li)	60871-90-1
	Perfluoroheptanoate (anion)	120885-29-2
HPFHpA, its salts	7H-Dodecafluoroheptane acid (HPFHpA)	1546-95-8
	Sodium 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluoroheptanoate (HPFHpA-Na)	2264-25-7
	Ammonium 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluoroheptanoate (HPFHpA-NH <sub>4</sub> )	376-34-1
PFHpS, its salts	Perfluoroheptane sulfonate (PFHpS)	375-92-8
	Perfluoroheptanesulfonate Na-salt (PFHpS-Na)	21934-50-9

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Group Name	Substance Name	CAS No.
PFHpS, its salts	Potassium perfluoroheptanesulfonate (PFHpS-K)	60270-55-5
	Ammonium perfluoroheptanesulfonate (PFHpS-NH <sub>4</sub> )	68259-07-4
	Lithium perfluoroheptanesulfonate (PFHpS-Li)	117806-54-9
	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)	70225-15-9
	Perfluoroheptane sulfonate (anion)	146689-46-5
PFOS, its salts & derivatives	Perfluorooctane sulfonates (PFOS)	1763-23-1
	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH <sub>4</sub> )	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) <sub>2</sub> )	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub> )	56773-42-3
	N-decyl-N,N-dimethyldecyl-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	TetrabutylAmmonium perfluorooctanesulfonate (PFOS-N(C <sub>4</sub> H <sub>9</sub> ) <sub>4</sub> )	111873-33-7
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
PFOSA, its salts	Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
	Perfluorooctanesulfonamide (PFOSA)	754-91-6
	Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li)	76752-79-9
	Perfluorooctanesulfonamide Sodium salt (1:1) (PFOSA-Na)	76752-78-8
	Perfluorooctanesulfonamide Potassium salt (1:1) (PFOSA-K)	76752-70-0
Perfluorooctanesulfonamide Ammonium salt (1:1) (PFOSA-NH <sub>4</sub> )	76752-72-2	
PFOA, its salts & derivatives	Perfluorooctanoic acid (PFOA)	335-67-1
	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	Silver perfluorooctanoate (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6

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JX METALS CORPORATION, ISOHARA WORKS

187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Group Name	Substance Name	CAS No.
PFOA, its salts & derivatives	Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3 <sup>+</sup> ))	68141-02-6
	Pentadecafluorooctanoic acid--piperazine (2/1)PFOA-NH(C <sub>4</sub> H <sub>10</sub> N)	423-52-9
	Pentadecafluorooctanoate (anion)	45285-51-6
	Perfluorooctanoic Anhydride	33496-48-9
8:2 FTS, its salts	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	39108-34-4
	1H,1H,2H,2H-Perfluorodecane sulfonate acid Potassium salt (8:2 FTS-K)	438237-73-1
	1H,1H,2H,2H-Perfluorodecane sulfonate acid Ammonium salt (8:2 FTS-NH <sub>4</sub> )	149724-40-3
	1H,1H,2H,2H-Perfluorodecane sulfonate acid Sodium salt (8:2 FTS-Na)	27619-96-1
PFNA, its salts	Perfluorononan-1-oic acid (PFNA)	375-95-1
	Perfluorononanoate Na-salt (PFNA-Na)	21049-39-8
	Perfluorononanoate ammonium salt (APFN)	4149-60-4
	Potassium perfluorononanoate (PFNA-K)	21049-38-7
	Perfluorononanoate Li-Salt (PFNA-Li)	60871-92-3
	Silver perfluorononanoate (PFNA-Ag)	7358-16-9
	Methanaminium perfluorononanoate (PFNA-NH <sub>3</sub> (CH <sub>3</sub> ))	77032-23-6
	Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with N-ethylethanamine (1:1) PFNA-NH <sub>2</sub> (C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> )	77032-27-0
	Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with N-methylmethanamine (1:1) (PFNA-NH <sub>2</sub> (CH <sub>3</sub> ) <sub>2</sub> )	77032-24-7
	Nonanoic acid, heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (9CI) (PFNA-NH(C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> )	327176-80-7
	Nonanoic acid, heptadecafluoro-, compd. with piperidine (1:1) (9CI) (PFNA-NH <sub>2</sub> (C <sub>5</sub> H <sub>10</sub> ))	95682-66-9
	Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with benzenamine (1:1) (PFNA-NH <sub>3</sub> (C <sub>6</sub> H <sub>5</sub> ))	95682-67-0
	Nonanoic acid, heptadecafluoro-, compd. with cyclohexanamine (1:1) (9CI) (PFNA-NH <sub>3</sub> (C <sub>6</sub> H <sub>11</sub> ))	328531-06-2
	Perfluorononanoate (anion)	72007-68-2

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JX METALS CORPORATION, ISOHARA WORKS

187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Group Name	Substance Name	CAS No.
PFDA, its salts	Perfluorodecane acid (PFDA)	335-76-2
	Perfluorodecanoate Na-salt (PFDA-Na)	3830-45-3
	Perfluorodecanoate ammonium salt (APFDA)	3108-42-7
	Potassium perfluorodecanoate (PFDA-K*)	51604-85-4
	Silver perfluorodecanoate (PFDA-Ag)	5784-82-7
	Lithium perfluorodecanoate (PFDA-Li)	84743-32-8
	Perfluorodecanoate (anion)	73829-36-4
PFUnDA, its salts	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Ammonium perfluoroundecanoate (PFUnDA-NH <sub>4</sub> )	4234-23-5
	Perfluoroundecanoic acid sodium salt (PFUnDA-Na)	60871-96-7
	Potassium perfluoroundecanoate (PFUnDA-K)	30377-53-8
	Calcium perfluoroundecanoate (PFUnDA-Ca)	97163-17-2
	Perfluoroundecanoate (anion)	196859-54-8
PFDoDA, its salts	Perfluorododecanoic acid (PFDoDA)	307-55-1
	Ammonium perfluorododecanoate (APFDoDA)	3793-74-6
	Sodium perfluorododecanoate (PFDoDA-Na)	60872-01-7
	Perfluorododecanoate (anion)	171978-95-3
PFTTrDA, its salts	Pentacosfluorotridecanoic acid (PFTTrDA)	72629-94-8
	Ammonium perfluorotridecanoate (PFTTrDA-NH <sub>4</sub> )	4288-72-6
	Perfluorotridecanoate (anion)	862374-87-6
PFTDA, its salts	Perfluorotetradecanoic acid (PFTDA)	376-06-7
	Perfluorotetradecanoate (anion)	365971-87-5
PFNS, its salts	Perfluorononane sulfonic acid (PFNS)	68259-12-1
	Sodium perfluoro-1-nonesulfonate (PFNS-Na*)	98789-57-2
	Ammonium nonadecafluorononesulphonate (PFNS-NH <sub>4</sub> )	17202-41-4
	Potassium perfluorononesulfonate (PFNS-K*)	29359-39-5
PFUnDS, its salts	Perfluoroundecane sulfonic acid (PFUnDS)	749786-16-1
	Perfluoroundecanesulfonate (anion)	441296-91-9
PFDoDS, its salts	Perfluorododecane sulfonic acid (PFDoDS)	79780-39-5
	Sodium perfluoro-1-dodecanesulfonate (PFDoDS-Na*)	1260224-54-1
	Potassium perfluorododecanesulfonate (PFDoDS-K)	85187-17-3
	Perfluorododecane sulfonate (anion)	343629-43-6
PFTTrDS, its salts	Perfluorotridecane sulfonic acid (PFTTrDS)	791563-89-8
	Sodium perfluoro-1-tridecanesulfonate (PFTTrDS-Na*)	174675-49-1

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187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

Group Name	Substance Name	CAS No.
PFDS, its salts	Perfluorodecane sulfonate (PFDS)	335-77-3
	Perfluorodecanesulfonate Na-salt (PFDS-Na)	2806-15-7
	Perfluorodecanesulfonate K-salt (PFDS-K)	2806-16-8
	Perfluoroaliphatic dean-sulfonate salt of NH <sub>4</sub> (PFDS-NH <sub>4</sub> )	67906-42-7
	Perfluorodecane sulfonate (anion)	126105-34-8
ADONA, its salts	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4
	Ammonium 4,8-dioxa-3H-perfluorononanoate (ADONA-NH <sub>4</sub> )	958445-44-8
	Sodium 4,8-dioxa-3H-perfluorononanoate (ADONA-Na)	2250081-67-3
H2PFDA, its salts	2H,2H-Perfluorodecane acid (H2PFDA)	27854-31-5
	Tetrabutylphosphonium 2H,2H-Perfluorodecanoate	882489-14-7
HFPO-DA, its salts & derivatives	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acide (HFPO-DA)	13252-13-6
	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionicacid, K-salts	67118-55-2
	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionicacid, ammonium salts	62037-80-3
	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionicacid, its acyl halides	2062-98-8
4:2 FTS, its salts	1H,1H,2H,2H-Perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
	1H,1H,2H,2H-perfluorohexane sulfonate acid sodium salt	27619-93-8
4HPFUnA, its salts	2H,2H,3H,3H-Perfluoroundecanoic Acid (4HPFUnA)	34598-33-9
	Potassium 2H,2H,3H,3H-Perfluoroundecanoate (H4PFUnA-K)	83310-58-1
PFPeS, its salts	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Sodium perfluoro-1-pentanesulfonate (PFPeS-Na*)	630402-22-1
	Potassium perfluoropentane-1-sulphonate (PFPeS-K)	3872-25-1
	Ammonium perfluoropentanesulfonate (PFPeS-NH <sub>4</sub> *)	68259-09-6
	Bis(2-hydroxyethyl) ammonium 1,1,2,2,3,3,4,4,5,5,5-undecafluoropentane-1-sulphonate	70225-17-1
	Undecafluoropentane-1-sulfonic acid lithium salt (PFPeS-Li)	1046864-81-6
	Perfluoropentane sulfonate (anion)	175905-36-9
8:2diPAP, its salts	Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate (8:2diPAP)	678-41-1
	Sodium bis(1H,1H,2H,2H-perfluorodecyl)phosphate (8:2diPAP-Na)	114519-85-6

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187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

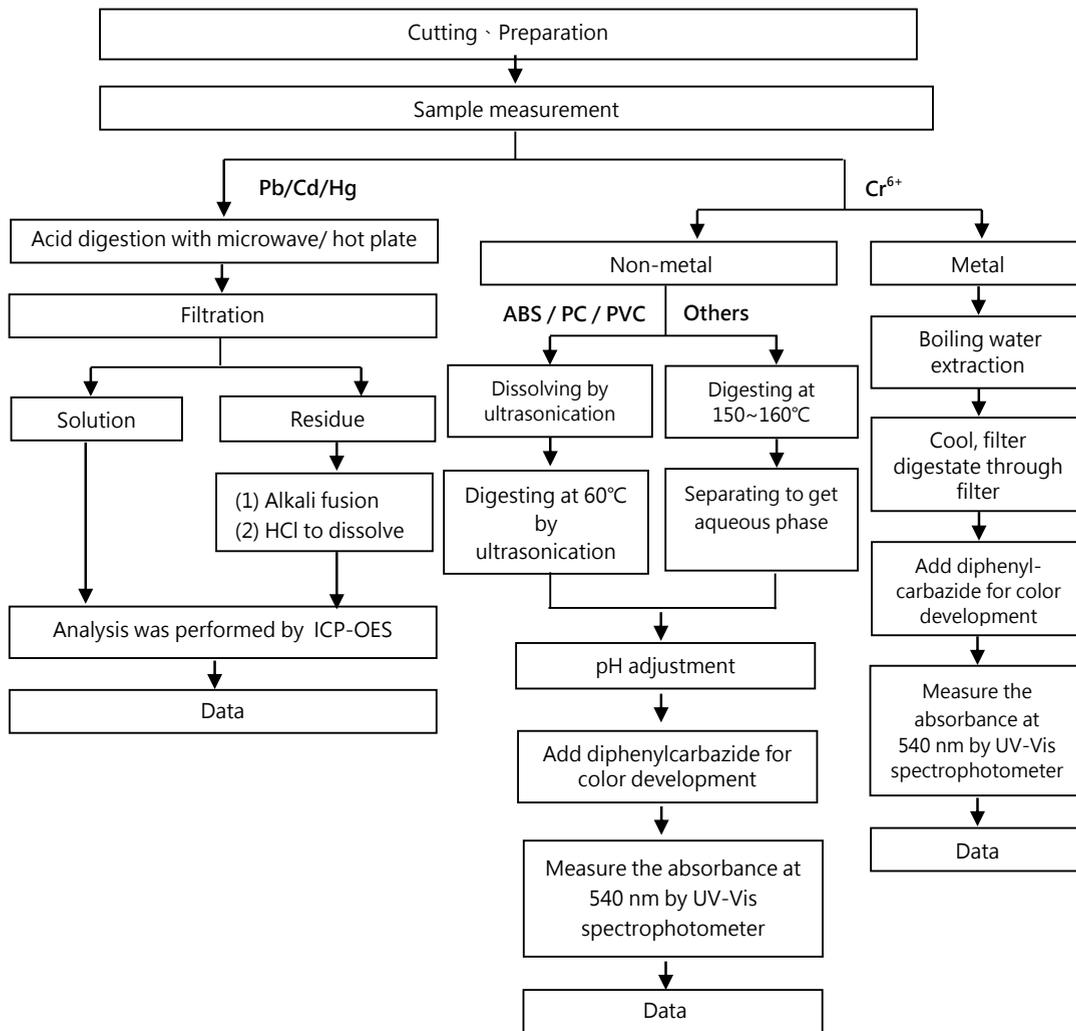
Group Name	Substance Name	CAS No.
11H-PFUnDA, its salts	11H-Perfluoroundecanoic acid (11H-PFUnDA)	1765-48-6
	potassium 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11-icosaf luoroundecanoate (11H-PFUnDA-K)	307-71-1
	Ammonium 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11-icosaf luoroundecanoate (11H-PFUnDA-NH <sub>4</sub> )	5081-02-7
PFPrA, its salts	Pentafluoropropionate acid (PFPrA)	422-64-0
	Sodium pentafluoropropionate (PFPrA-Na)	378-77-8
	Silver pentafluoropropionate (PFPrA-Ag)	509-09-1
	Potassium pentafluoropropionate (PFPrA-K)	378-76-7
	Ammonium pentafluoropropionate (PFPrA-NH <sub>4</sub> )	2730-58-7

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## Analytical flow chart of heavy metal

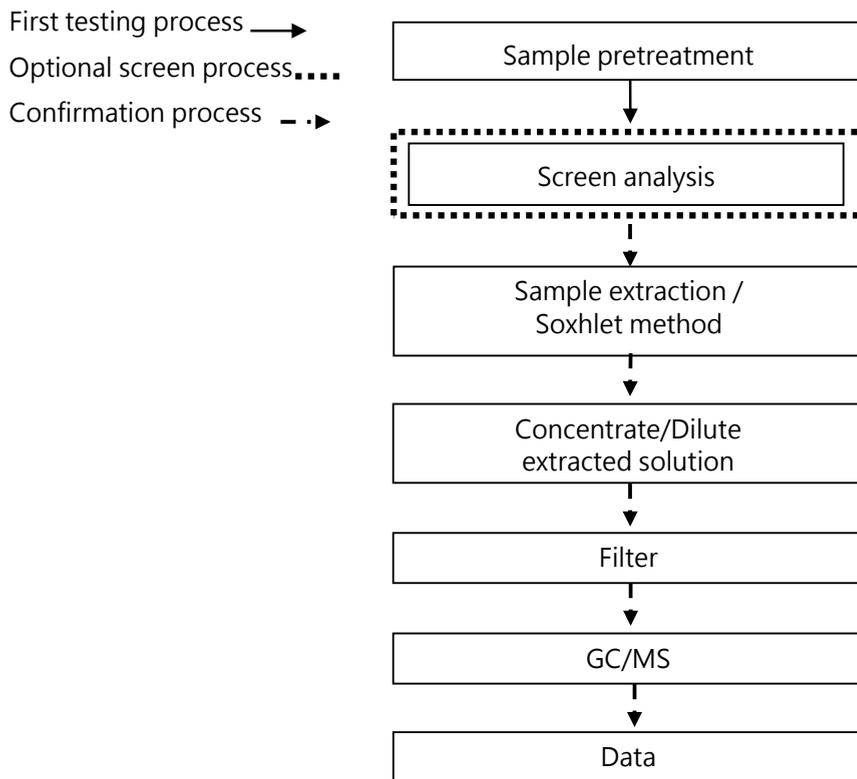
These samples were dissolved totally by pre-conditioning method according to below flow chart.

( Cr<sup>6+</sup> test method excluded )



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### Analytical flow chart – PBBs / PBDEs

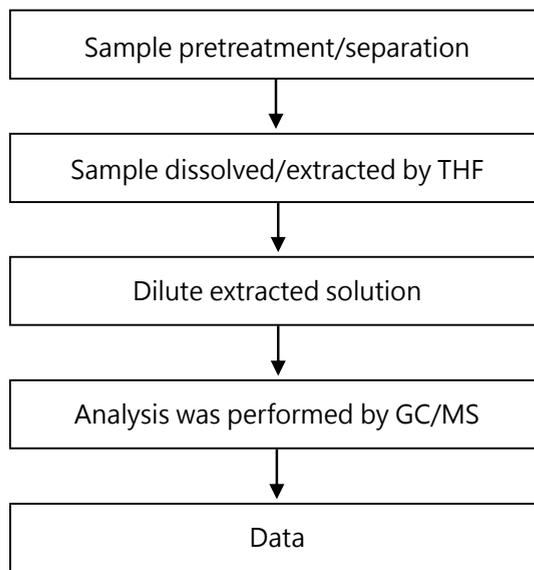


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187-4 USUBA, HANAKAWA-CHO, KITAIBARAKI-SHI, IBARAKI, 319-1535, JAPAN

### Analytical flow chart - Phthalate

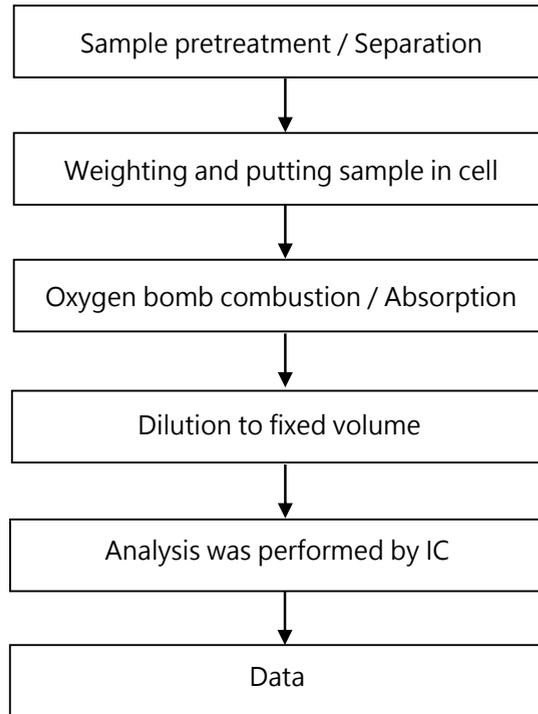
【 Test method: IEC 62321-8 】



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### Analytical flow chart - Halogen

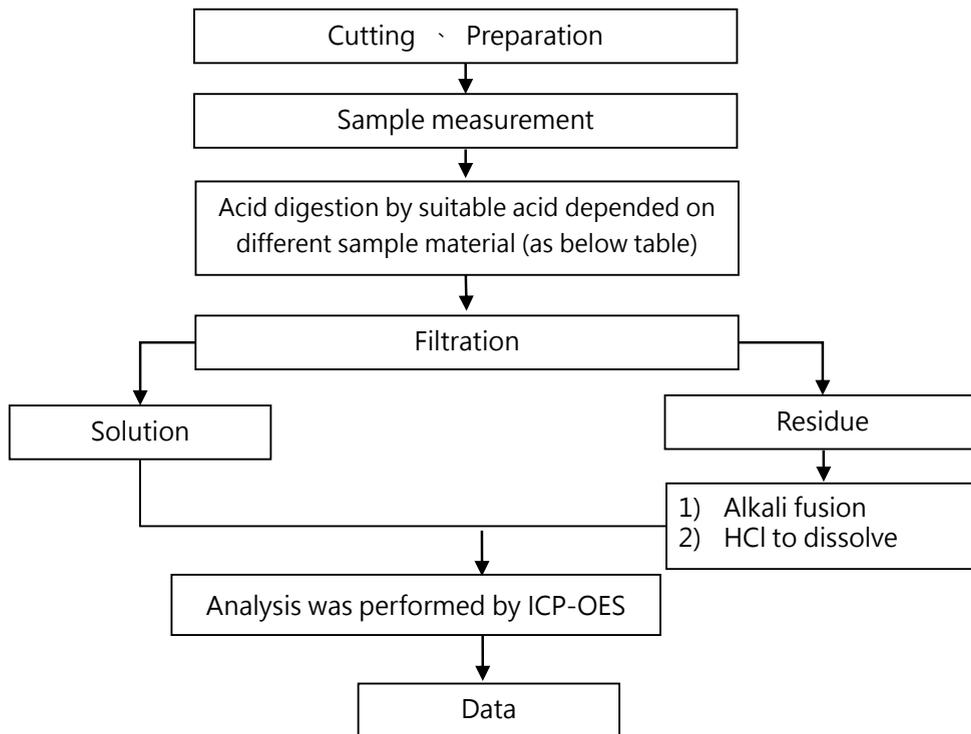


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### Flow chart of digestion for the elements analysis performed by ICP-OES

These samples were dissolved totally by pre-conditioning method according to below flow chart.

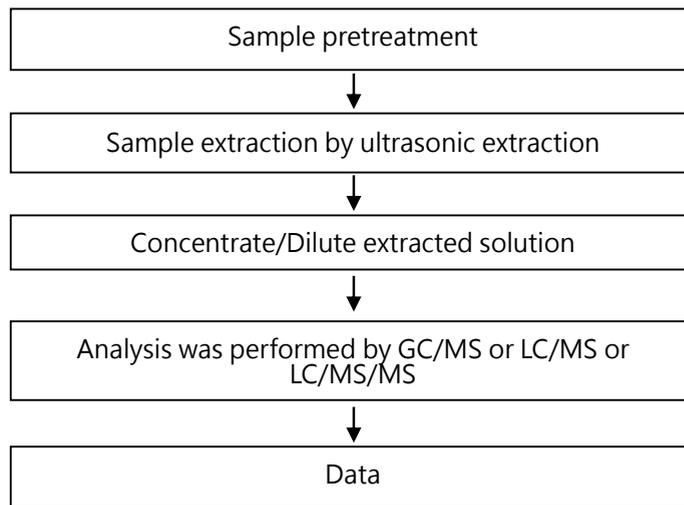


Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Added appropriate reagent to total digestion

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### Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

### ETR24500383



\*\* End of Report \*\*

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