

Test Report

No.: ETR23C00005

Date: 19-Dec-2023

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

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

Sample Submitted By : Taiwan Semiconductor Manufacturing Company, Ltd.
Sample Name : TSMC Fab 2 Finished Wafer

Sample Receiving Date : 01-Dec-2023
Testing Period : 01-Dec-2023 to 19-Dec-2023

- 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 specified by client, the sample(s) was/were tested for 5 PBTs with reference to Regulation of Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h). Please refer to result table for testing item(s).
 - (3) As requested by the client, the risk of specific PFAS in the selected sample is evaluated. The total amounts of evaluated PFAS are 235 items, concluding 92 tested items and 143 listed items (see PFAS Remark).
 - (4) 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.
 - (2) Based on the performed tests on submitted sample(s), the test result(s) comply with the limits as set by Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h).


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



PIN CODE: 0475B907

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Taiwan Semiconductor Manufacturing Company, Ltd.
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Test Part Description

No.1 : WAFER

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) | With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS. | mg/kg | 8 | n.d. | 1000 |
| 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. | - |
| Sum of PBBs | | 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. | - | |
| Sum of PBDEs | 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. | - |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) | With reference to IEC 62321: 2008, analysis was performed by GC/MS. | mg/kg | 5 | 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. | - |
| Polychlorinated biphenyls (PCBs) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 0.5 | n.d. | - |
| Polychlorinated naphthalene (PCNs) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | - |
| Polychlorinated terphenyls (PCTs) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 0.5 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|---|-------|-------|--------|-------|
| | | | | No.1 | |
| Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8) | With reference to ISO 18219-1: 2021, analysis was performed by GC/MS. | mg/kg | 50 | n.d. | - |
| Tributyl tin (TBT) | With reference to ISO 17353: 2004, analysis was performed by GC/FPD. | mg/kg | 0.03 | n.d. | - |
| Triphenyl tin (TPT) | | mg/kg | 0.03 | n.d. | - |
| Dibutyl tin (DBT) | | mg/kg | 0.03 | n.d. | - |
| Diocetyl tin (DOT) | | mg/kg | 0.03 | n.d. | - |
| Bis(tributyltin) oxide (TBTO) (CAS No.: 56-35-9) | Calculated from the result of Tributyl Tin (TBT). | mg/kg | 0.03▲ | n.d. | - |
| AZO Dyes | | | | | |
| 4-aminodiphenyl (CAS No.: 92-67-1) | With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD. | mg/kg | 3 | n.d. | - |
| Benzidine (CAS No.: 92-87-5) | | mg/kg | 3 | n.d. | - |
| 4-chloro-o-toluidine (CAS No.: 95-69-2) | | mg/kg | 3 | n.d. | - |
| 2-naphthylamine (CAS No.: 91-59-8) | | mg/kg | 3 | n.d. | - |
| o-aminoazotoluene (CAS No.: 97-56-3) | | mg/kg | 3 | n.d. | - |
| 5-nitro-o-toluidine (CAS No.: 99-55-8) | | mg/kg | 3 | n.d. | - |
| 4-chloroaniline (CAS No.: 106-47-8) | | mg/kg | 3 | n.d. | - |
| 2,4-diaminoanisole (CAS No.: 615-05-4) | | mg/kg | 3 | n.d. | - |
| 4,4'-diaminodiphenylmethane (MDA) (CAS No.: 101-77-9) | | mg/kg | 3 | n.d. | - |
| 3,3'-dichlorobenzidine (CAS No.: 91-94-1) | | mg/kg | 3 | n.d. | - |
| 3,3'-dimethoxybenzidine (CAS No.: 119-90-4) | | mg/kg | 3 | n.d. | - |
| 3,3'-dimethylbenzidine (CAS No.: 119-93-7) | | mg/kg | 3 | n.d. | - |
| 3,3'-dimethyl-4,4'-diaminodiphenylmethane (CAS No.: 838-88-0) | | mg/kg | 3 | n.d. | - |
| 2-methoxy-5-methylaniline (CAS No.: 120-71-8) | | mg/kg | 3 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|--|-------|-----|----------|-------------------------|
| | | | | No.1 | |
| 4,4'-methylene-bis-(2-chloroaniline) (CAS No.: 101-14-4) | With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD. | mg/kg | 3 | n.d. | - |
| 4,4'-oxydianiline (CAS No.: 101-80-4) | | mg/kg | 3 | n.d. | - |
| 4,4'-thiodianiline (CAS No.: 139-65-1) | | mg/kg | 3 | n.d. | - |
| o-toluidine (CAS No.: 95-53-4) | | mg/kg | 3 | n.d. | - |
| 2,4-diaminotoluene (CAS No.: 95-80-7) | | mg/kg | 3 | n.d. | - |
| 2,4,5-trimethylaniline (CAS No.: 137-17-7) | | mg/kg | 3 | n.d. | - |
| o-anisidine (CAS No.: 90-04-0) | | mg/kg | 3 | n.d. | - |
| 4-aminoazobenzene (CAS No.: 60-09-3) | With reference to EN ISO 14362-1: 2017 or/and EN ISO 14362-3: 2017, analysis was performed by GC/MS & HPLC/DAD. | mg/kg | 3 | n.d. | - |
| 2,4-xylydine (CAS No.: 95-68-1) | With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD. | mg/kg | 3 | n.d. | - |
| 2,6-xylydine (CAS No.: 87-62-7) | | mg/kg | 3 | n.d. | - |
| Asbestos | | | | | |
| Actinolite (CAS No.: 77536-66-4) | With reference to EPA 600/R-93/116: 1993, analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD). | - | - | Negative | - |
| Amosite (CAS No.: 12172-73-5) | | - | - | Negative | - |
| Anthophyllite (CAS No.: 77536-67-5) | | - | - | Negative | - |
| Chrysotile (CAS No.: 12001-29-5) | | - | - | Negative | - |
| Crocidolite (CAS No.: 12001-28-4) | | - | - | Negative | - |
| Tremolite (CAS No.: 77536-68-6) | | - | - | Negative | - |
| Decabromodiphenyl ether (DecaBDE) (CAS No.: 1163-19-5) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | Prohibited / N/A(*3) |
| Phenol, isopropylated, phosphate (3:1) (PIP 3:1) (CAS No.: 68937-41-7) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | Prohibited / N/A(*1) |
| 2,4,6-Tris(tert-butyl)phenol (2,4,6- TTBP) (CAS No.: 732-26-3) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | 3000 / N/A(*2) |
| Pentachlorothiophenol (PCTP) (CAS No.: 133-49-3) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | 10000 |
| Hexachlorobutadiene (HCBD) (CAS No.: 87-68-3) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 5 | n.d. | Prohibited |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|--|-------|-----|--------|-------|
| | | | | No.1 | |
| Chlorofluorocarbons (CFCs) | | | | | |
| CFC-13 (CAS No.: 75-72-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-111 (CAS No.: 354-56-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-112 (CAS No.: 76-12-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-211 (CAS No.: 422-78-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-212 (CAS No.: 3182-26-1) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-213 (CAS No.: 2354-06-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-214 (CAS No.: 29255-31-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-215 (CAS No.: 4259-43-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-216 (CAS No.: 661-97-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-217 (CAS No.: 422-86-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-12 (CAS No.: 75-71-8) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-11 (CAS No.: 75-69-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-115 (CAS No.: 76-15-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-114 (CAS No.: 76-14-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| CFC-113 (CAS No.: 76-13-1) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Hydrochlorofluorocarbons (HCFCs) | | | | | |
| HCFC-21 (CAS No.: 75-43-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-22 (CAS No.: 75-45-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--------------------------------|--|-------|-----|--------|-------|
| | | | | No.1 | |
| HCFC-31 (CAS No.: 593-70-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-121 (CAS No.: 354-14-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-122 (CAS No.: 354-21-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-123 (CAS No.: 306-83-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-124 (CAS No.: 2837-89-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-131 (CAS No.: 359-28-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-132b (CAS No.: 1649-08-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-133a (CAS No.: 75-88-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-142b (CAS No.: 75-68-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-221 (CAS No.: 422-26-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-222 (CAS No.: 422-49-1) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-223 (CAS No.: 422-52-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-224 (CAS No.: 422-54-8) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-225ca (CAS No.: 422-56-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-225cb (CAS No.: 507-55-1) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-226 (CAS No.: 431-87-8) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-231 (CAS No.: 421-94-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-232 (CAS No.: 460-89-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--------------------------------|--|-------|-----|--------|-------|
| | | | | No.1 | |
| HCFC-233 (CAS No.: 7125-84-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-234 (CAS No.: 425-94-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-235 (CAS No.: 460-92-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-241 (CAS No.: 666-27-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-242 (CAS No.: 460-63-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-244 | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-251 (CAS No.: 421-41-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-252 (CAS No.: 819-00-1) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-261 (CAS No.: 420-97-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-262 (CAS No.: 421-02-03) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-271 (CAS No.: 430-55-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-141b (CAS No.: 1717-00-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-243 (CAS No.: 460-69-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-253 (CAS No.: 460-35-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-141 | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-142 | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-151 | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HCFC-225 | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|--|-------|-----|--------|-------|
| | | | | No.1 | |
| Halons | | | | | |
| Halon-1211 (CAS No.: 353-59-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Halon-1301 (CAS No.: 75-63-8) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Halon-2402 (CAS No.: 124-73-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Methyl Bromide (CAS No.: 74-83-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Hydrobromofluorocarbons (HBFCs) | | | | | |
| HBFC-271B1 (C3H6FBr) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-262B1 (C3H5F2Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-261B2 (C3H5FBr2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-253B1 (C3H4F3Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-252B2 (C3H4F2Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-251B3 (C3H4FBr3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-244B1 (C3H3F4Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-243B2 (C3H3F3Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-242B3 (C3H3F2Br3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-241B4 (C3H3FBr4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-235B1 (C3H2F5Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-234B2 (C3H2F4Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-233B3 (C3H2F3Br3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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|------------------------|--|-------|-----|--------|-------|
| | | | | No.1 | |
| HBFC-232B4 (C3H2F2Br4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-231B5 (C3H2FBr5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-226B1 (C3HF6Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-225B2 (C3HF5Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-224B3 (C3HF4Br3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-223B4 (C3HF3Br4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-222B5 (C3HF2Br5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-221B6 (C3HFBr6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-151B1 (C2H4FBr) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-142B1 (C2H3F2Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-141B2 (C2H3FBr2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-133B1 (C2H2F3Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-132B2 (C2H2F2Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-131B3 (C2H2FBr3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-124B1 (C2HF4Br) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-123B2 (C2HF3Br2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-122B3 (C2HF2Br3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-121B4 (C2HFBr4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|--|-------|-----|--------|-------|
| | | | | No.1 | |
| HBFC-31B1 (CH2FBr) (CAS No.: 373-52-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-22B1 (CHF2Br) (CAS No.: 1511-62-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HBFC-21B2 (CHFBr2) (CAS No.: 1868-53-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Hydrofluorocarbon (HFCs) | | | | | |
| HFC-23 (CHF3) (CAS No.: 75-46-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-32 (CH2F2) (CAS No.: 75-10-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-41 (CH3F) (CAS No.: 593-53-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-43-10mee (C5H2F10) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-125 (C2HF5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-134 (C2H2F4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-134a (CH2FCF3) (CAS No.: 811-97-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-143 (CH3F3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-143a (CH3F3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-152a (C2H4F2) (CAS No.: 75-37-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-227ea (C3HF7) (CAS No.: 431-89-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-236fa (CAS No.: 431-63-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-245ca (C3H3F5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-245fa (C3H3F5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|--|-------|-----|--------|-------|
| | | | | No.1 | |
| HFC-365mfc (C4H5F5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| HFC-236ea (C3H2F6) (CAS No.: 431-63-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Perfluorocarbon (PFCs) | | | | | |
| 1,4-dihydrooctafluorobutane (CAS No.: 377-36-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 2-Perfluoromethylpentane (CAS No.: 355-04-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Decafluorobutane (CAS No.: 355-25-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| F14 (CAS No.: 75-73-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Fluorocarbon 116 (CAS No.: 76-16-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Freon 218 (CAS No.: 76-19-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Freon C318 (CAS No.: 115-25-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Nonafluor-2-(trifluoromethyl)butane (CAS No.: 594-91-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Perfluoroisobutene (CAS No.: 382-21-8) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Perfluorohexane (CAS No.: 355-42-0) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Perfluoro-n-pentane (CAS No.: 678-26-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Perfluoro-1-butene (CAS No.: 357-26-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Chlorinate hydrocarbon (CHCs) | | | | | |
| 1,1-Dichloropropene (CAS No.: 563-58-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,2-Dichloroethane (CAS No.: 107-06-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 2,2-Dichloropropane (CAS No.: 594-20-7) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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|--|--|-------|-----|--------|-------|
| | | | | No.1 | |
| Carbon tetrachloride (CAS No.: 56-23-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Chloromethane (CAS No.: 74-87-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| cis-1,2-Dichloroethene (CAS No.: 156-59-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| cis-1,3-Dichloropropene (CAS No.: 10061-01-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Hexachlorobutadiene (CAS No.: 87-68-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| trans-1,2-Dichloroethene (CAS No.: 156-60-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| trans-1,3-Dichloropropene (CAS No.: 10061-02-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Dichloromethane, Methylene chloride (CAS No.: 75-09-2) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,2-Dichloropropane (CAS No.: 78-87-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1,1,2-Tetrachloroethane (CAS No.: 630-20-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1,1-Trichloroethane (CAS No.: 71-55-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1,2-Trichloroethane (CAS No.: 79-00-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1,2,2-Tetrachloroethane (CAS No.: 79-34-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1-Dichloroethylene (CAS No.: 75-35-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,1-Dichloroethane (CAS No.: 75-34-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Chloroethane (CAS No.: 75-00-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Tetrachloroethene (CAS No.: 127-18-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Trichloroethylene (CAS No.: 79-01-6) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|---|----------|------|-----------|-------|
| | | | | No.1 | |
| 1,3-Dichloropropane (CAS No.: 142-28-9) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Chloroform (CAS No.: 67-66-3) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| 1,2,3-Trichloropropane (CAS No.: 96-18-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Bromochloromethan (CAS No.: 74-97-5) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Sulfur hexafluoride (CAS No.: 2551-62-4) | With reference to US EPA 5021A: 2014, analysis was performed by GC/MS. | mg/kg | 1 | n.d. | - |
| Ethylene glycol monomethyl ether (CAS No.: 109-86-4) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| 2-Ethoxyethanol (CAS No.: 110-80-5) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Ethylene glycol monomethyl ether acetate (CAS No.: 110-49-6) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| 2-Ethoxyethyl acetate (CAS No.: 111-15-9) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Diethylene glycol monomethyl ether (CAS No.: 111-77-3) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Ethylene glycol monobutyl ether (CAS No.: 111-76-2) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Diethylene glycol dimethyl ether (DEGDME) (CAS No.: 111-96-6) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| 2-(2-butoxyethoxy) ethanol (CAS No.: 112-34-5) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Ethylene glycol dimethyl ether (CAS No.: 110-71-4) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| 1,2-bis(2-methoxyethoxy) ethane (CAS No.: 112-49-2) | With reference to US EPA 3550C: 2007, analysis was performed by GC/MS. | mg/kg | 10 | n.d. | - |
| Radioactive substances | Geiger counter. | µSv/hour | - | Negative* | - |
| PFAS | | | | | |
| 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. | - |

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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. | - |
| 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. | - |
| 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. | - |
| 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. | - |
| 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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8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| 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-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,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. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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. | - |
| 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 | 0.01 | 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. | - |
| 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. | - |
| Perfluoroundecane sulfonic acid and its salts (PFUnDS and its salts) (CAS No.: 749786-16-1, 441296-91-9 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. | - |
| 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. | - |
| 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. | - |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|------|--------|-------|
| | | | | No.1 | |
| Nonafluoro-3,6-dioxahexanoic 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 (ADONA) (CAS No.: 919005-14-4) | With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS. | mg/kg | 0.01 | n.d. | - |
| 1H,1H,2H,2H-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. | - |
| 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. | - |
| 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. | - |

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Test Report

No.: ETR23C00005

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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. | - |
| Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA) (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. | - |
| 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. | - |
| 11H-Perfluoroundecanoic acid (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 | 0.01 | 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. | - |
| 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. | - |
| 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 Report

No.: ETR23C00005

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|---|---|-------|------|--------|-------|
| | | | | No.1 | |
| 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]- (CAS No.: 68957-32-4) | 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. | - |
| 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. | - |
| Arsenic (As) (CAS No.: 7440-38-2) | With reference to US EPA 3052: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. | - |
| Beryllium (Be) (CAS No.: 7440-41-7) | With reference to US EPA 3052: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. | - |
| Antimony (Sb) (CAS No.: 7440-36-0) | With reference to US EPA 3052: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. | - |
| Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7) | With reference to RSTS-E&E-121, analysis was performed by LC/MS. | mg/kg | 10 | n.d. | - |

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

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5. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".

6. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

| AX | A | F |
|------------------------------|--------------------|--------|
| Bis(tributyltin)oxide (TBTO) | Tributyl Tin (TBT) | 1.0276 |

Parameter Conversion Table : https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others

7. Negative*/Positive*: The test result of Geiger counter is from comparison between test outcome and environment background. In general, there is little radiation dose existing in environment. (Radiation dose from environment background usually less than or equal to 0.2µSv/hr)

The test result less than environment background was shown as Negative*; the result greater than environment background was shown as Positive*.

8. 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.

9. Detail explanation of the regulation is available at the following link.

<https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/persistent-bioaccumulative-and-toxic-pbt-chemicals-under>

10. N/A(*1) : The submitted sample is exempted from the regulated scope if it is anyone of the following :

- Hydraulic fluids for aviation or military
- Lubricants and grease
- New and replacement parts for motor and aerospace vehicles
- Manufacture of cyanoacrylate adhesives in closed systems
- Specialized engine air filters for locomotive and marine applications
- Plastic for recycling from PIP (3:1)-containing products or articles
- Finished products or articles made of plastic recycled from PIP (3:1)-containing products or articles
- Processing and distribution in commerce of PIP (3:1)-containing articles, before October 31, 2024

11. N/A(*2) : The submitted sample is exempted from the regulated scope if it is not oil and lubricant additives.

12. N/A(*3) : The submitted sample is exempted from the regulated scope if it is anyone of the following :
Exempts processing and distribution for recycling of DecaBDE-containing plastic from products or articles and DecaBDE-containing products or articles made from such recycled plastic.

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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 | PFBA | 375-22-4 |
| | Ammonium perfluorobutanoate (PFBA-NH ₄) | 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 |
| PFBS, its salts & derivatives | 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 ₃ CH ₂) ₄) | 25628-08-4 |
| | Triphenylsulfanium perfluorobutane sulfonate (TPS-PFBS) | 144317-44-2 |
| | Dimethyl(phenyl)sulfanium perfluorobutane sulfonate | 220133-51-7 |
| | Tetrabutyl-phosphonium nonafluoro-butane-1-sulfonate | 220689-12-3 |
| | Morpholinium perfluorobutanesulfonate | 503155-89-3 |
| | Ammonium 1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulphonate (PFBS-NH ₄) | 68259-10-9 |
| | Nonafluorobutanesulfonic acidHydrate | 59933-66-3 |
| | Nonafluoro-1-butanesulfonyl chloride (PFBS-Cl) | 2991-84-6 |
| | Bis(4-tert-butylphenyl)iodonium perfluoro-1-butanesulfonate (PFBS-I(C ₆ H ₄) ₂ (C ₄ H ₉) ₂) | 194999-85-4 |

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Taiwan Semiconductor Manufacturing Company, Ltd.

8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| 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 ₂ H ₅ O) ₂) | 70225-18-2 |
| | 1-(4-butoxy-1-naphthyl)tetrahydrothiophenium nonafluorobutane-1-sulfonate (PFBS-SC ₁₈ H ₂₃ O) | 209482-18-8 |
| PFPA, its salts | PFPA | 2706-90-3 |
| | Sodium perfluoropentanoate (PFPA-Na) | 2706-89-0 |
| | Potassium perfluoropentanoate (PFPA-K) | 336-23-2 |
| | Ammonium perfluoropentanoate (PFPA-NH ₄) | 68259-11-0 |
| | Lithium perfluoropentanoate (PFPA-Li) | 198482-22-3 |
| | Silver perfluoropentanoate (PFPA-Ag) | 2795-30-4 |
| PFHxA, its salts & derivatives | PFHxA | 307-24-4 |
| | Ammonium perfluorohexanoate (PFHxA-NH ₄) | 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 |
| 6:2 FTS, its salts | 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 ₄) | 59587-39-2 |
| | 1-Octanesulfonic acid, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-, barium salt (2:1) (6:2 FTS-Ba) | 1807944-82-6 |
| PFHxS, its salts & derivatives | PFHxS | 355-46-4 |
| | Perfluorohexanesulfonate Na-salt (PFHxS-Na) | 82382-12-5 |
| | Perfluorohexanesulfonate K-salt (PFHxS-K) | 3871-99-6 |
| | Ammonium perfluorohexanesulfonate (PFHxS-NH ₄) | 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 |
| | Phosphonium, triphenyl(phenylmethyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-1-hexanesulfonate (1:1) | 1000597-52-3 |

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Taiwan Semiconductor Manufacturing Company, Ltd.

8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Group Name | Substance Name | CAS No. |
|--|--|--------------|
| PFHxS, its salts & derivatives | 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 |

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Taiwan Semiconductor Manufacturing Company, Ltd.
8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Group Name | Substance Name | CAS No. |
|--------------------------------|---|-------------|
| PFHxS, its salts & derivatives | Sulfonium, (4-methylphenyl)diphenyl-, 1,1,2,2,3,3,4,4,5,5,6,6-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-tridecafluoro-1-hexanesulfonate (1:1) | 911027-68-4 |
| | 1-Hexanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6-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-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-tridecafluoro-1-hexanesulfonic acid (1:1), polymer with 2-ethyltricyclo[3.3.1.1 ^{3,7}]dec-2-yl 2-methyl-2-propenoate, 3-hydroxytricyclo[3.3.1.1 ^{3,7}]dec-1-yl 2-methyl-2-propenoate and tetrahydro-2-oxo-3-furanyl 2-methyl-2-propenoate | 911027-69-5 |
| PFHpA, its salts | PFHpA | 375-85-9 |
| | Sodium perfluoroheptanoate (PFHpA-Na) | 20109-59-5 |
| | Potassium perfluoroheptanoate (PFHpA-K) | 21049-36-5 |
| | Ammonium perfluoroheptanoate (PFHpA-NH ₄) | 6130-43-4 |
| | Cesium perfluoroheptanoate (PFHpA-Cs) | 171198-24-6 |
| | Silver perfluoroheptanoate (PFHpA-Ag) | 424-05-5 |
| | Lithium perfluoroheptanoate (PFHpA-Li) | 60871-90-1 |
| HPFHpA, its salts | 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 ₄) | 376-34-1 |
| PFHpS, its salts | PFHpS | 375-92-8 |
| | Perfluoroheptanesulfonate Na-salt (PFHpS-Na) | 21934-50-9 |
| | Potassium perfluoroheptanesulfonate (PFHpS-K) | 60270-55-5 |
| | Ammonium perfluoroheptanesulfonate (PFHpS-NH ₄) | 68259-07-4 |
| | Lithium perfluoroheptanesulfonate (PFHpS-Li) | 117806-54-9 |

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| Group Name | Substance Name | CAS No. |
|-------------------------------|--|-------------|
| PFOS, its salts & derivatives | 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 ₄) | 29081-56-9 |
| | Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂) | 70225-14-8 |
| | Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C ₂ H ₅) ₄) | 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-heptafluorooctane-1-sulfonate (PFOS-DDA) | 251099-16-8 |
| | 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 |
| | Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluorooctanesulfonate | 71463-74-6 |
| PFOSA, its salts | PFOSA | 754-91-6 |
| | Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li) | 76752-79-9 |
| PFOA, its salts & derivatives | 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 |
| 8:2 FTS, its salts | 8:2 FTS | 39108-34-4 |
| | 1H,1H,2H,2H-Perfluorododecane sulfonate acid Potassium salt (8:2 FTS-K) | 438237-73-1 |
| | 1H,1H,2H,2H-Perfluorododecane sulfonate acid Ammonium salt (8:2 FTS-NH ₄) | 149724-40-3 |
| | 1H,1H,2H,2H-Perfluorododecane sulfonate acid Sodium salt (8:2 FTS-Na) | 27619-96-1 |

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| Group Name | Substance Name | CAS No. |
|-------------------|--|--------------|
| PFNA, its salts | 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 |
| PFDA, its salts | 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 |
| PFUnDA, its salts | PFUnDA | 2058-94-8 |
| | Ammonium perfluoroundecanoate (PFUnDA-NH ₄) | 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 |
| PFDoDA, its salts | PFDoDA | 307-55-1 |
| | Ammonium perfluorododecanoate (APFDoDA) | 3793-74-6 |
| | Sodium perfluorododecanoate (PFDoDA-Na) | 60872-01-7 |
| PFTrDA, its salts | PFTrDA | 72629-94-8 |
| | Ammonium perfluorotridecanoate (PFTrDA-NH ₄) | 4288-72-6 |
| PFNS, its salts | PFNS | 68259-12-1 |
| | Sodium perfluoro-1-nonanesulfonate (PFNS-Na*) | 98789-57-2 |
| | Ammonium nonadecafluorononanesulphonate (PFNS-NH ₄) | 17202-41-4 |
| | Potassium perfluorononanesulfonate (PFNS-K*) | 29359-39-5 |
| PFDoDS, its salts | PFDoDS | 79780-39-5 |
| | Sodium perfluoro-1-dodecanesulfonate (PFDoDS-Na*) | 1260224-54-1 |
| PFTrDS, its salts | PFTrDS | 791563-89-8 |
| | Sodium perfluoro-1-tridecanesulfonate (PFTrDS-Na*) | 174675-49-1 |
| PFDS, its salts | PFDS | 335-77-3 |
| | Perfluorodecanesulfonate Na-salt (PFDS-Na) | 2806-15-7 |
| | Perfluorodecanesulfonate K-salt (PFDS-K) | 2806-16-8 |
| | Perfluoroaliphatic decan-sulfonate salt of NH ₄ (PFDS-NH ₄) | 67906-42-7 |

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Test Report

No.: ETR23C00005

Date: 19-Dec-2023

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Taiwan Semiconductor Manufacturing Company, Ltd.

8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-096, Taiwan, R.O.C.

| Group Name | Substance Name | CAS No. |
|----------------------------------|--|-------------|
| H2PFDA, its salts | H2PFDA | 27854-31-5 |
| | Tetrabutylphosphonium 2H,2H-Perfluorodecanoate | 882489-14-7 |
| HFPO-DA, its salts & derivatives | 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 |
| 4:2 FTS, its salts | 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionicacid, its acyl halides | 2062-98-8 |
| | 4:2 FTS | 757124-72-4 |
| 4HPFUnA and its salts | 1H,1H,2H,2H-perfluorohexane sulfonate acid sodium salt | 27619-93-8 |
| | 4HPFUnA | 34598-33-9 |
| 4HPFUnA and its salts | Potassium 2H,2H,3H,3H-Perfluoroundecanoate (H4PFUnA-K) | 83310-58-1 |
| | PFPeS | 2706-91-4 |
| PFPeS, its salts | Sodium perfluoro-1-pentanesulfonate (PFPeS-Na*) | 630402-22-1 |
| | Potassium perfluoropentane-1-sulphonate (PFPeS-K) | 3872-25-1 |
| | Ammonium perfluoropentanesulfonate (PFPeS-NH ₄ *) | 68259-09-6 |
| 8:2diPAP and its salts | 8:2diPAP | 678-41-1 |
| | Sodium bis(1H,1H,2H,2H-perfluorodecyl)phosphate (8:2diPAP-Na) | 114519-85-6 |
| 11H-PFUnDA, its salts | 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-icosafuoroundecanoate (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-icosafuoroundecanoate (11H-PFUnDA-NH ₄) | 5081-02-7 |

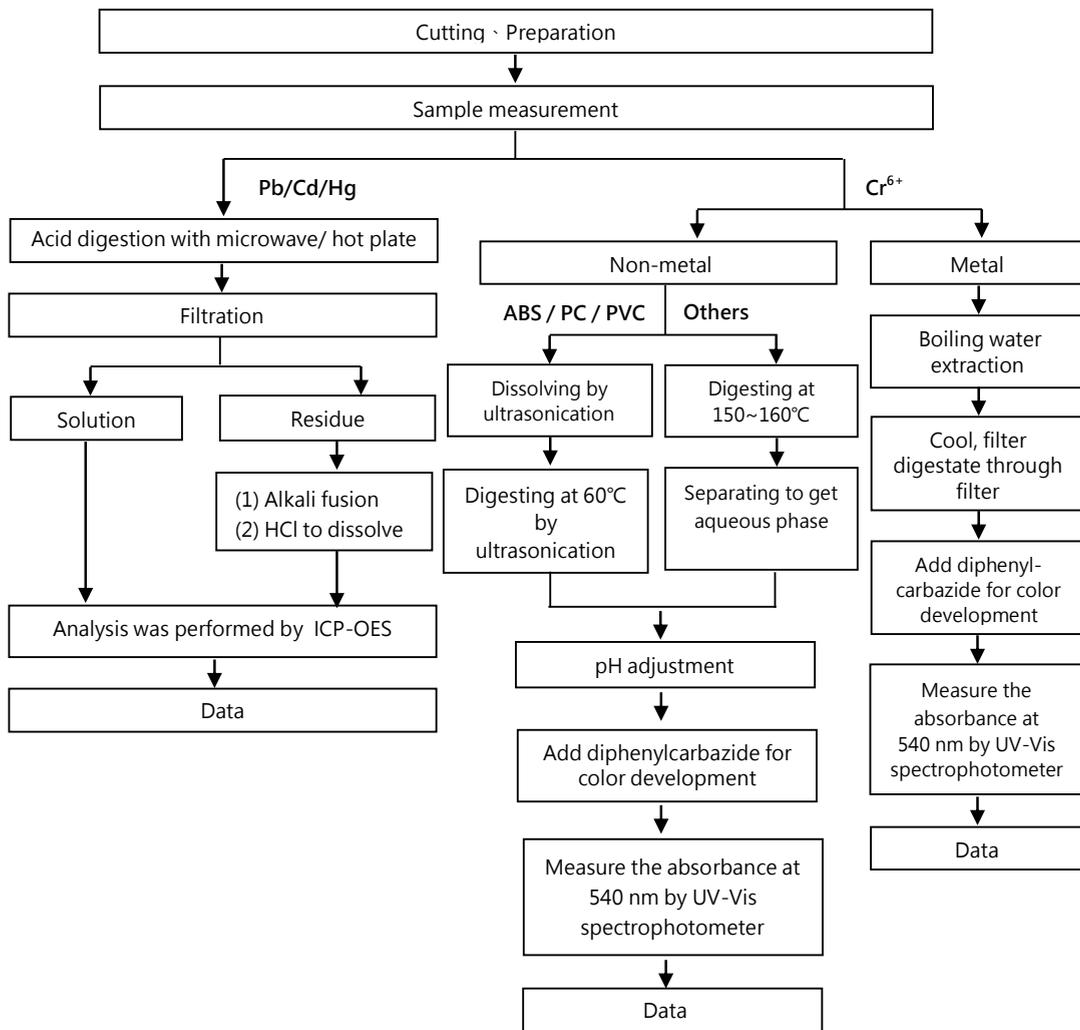
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Taiwan Semiconductor Manufacturing Company, Ltd.
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Analytical flow chart of heavy metal

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

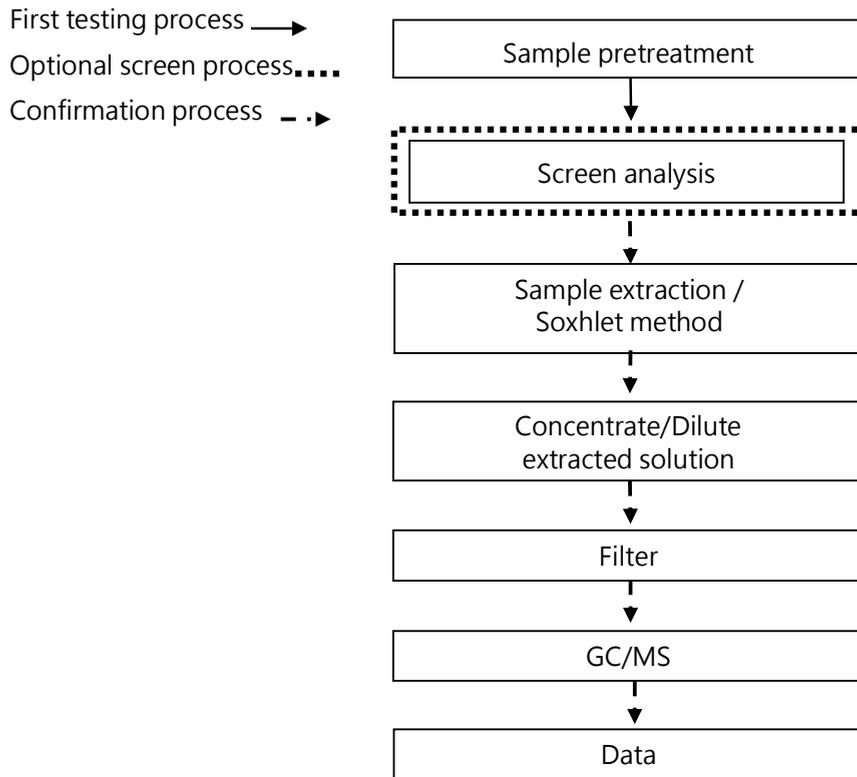
(Cr⁶⁺ test method excluded)



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Analytical flow chart – PBBs / PBDEs

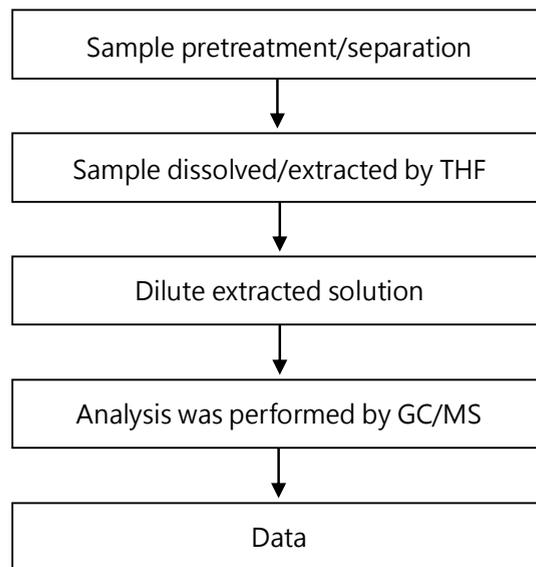


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Analytical flow chart - Phthalate

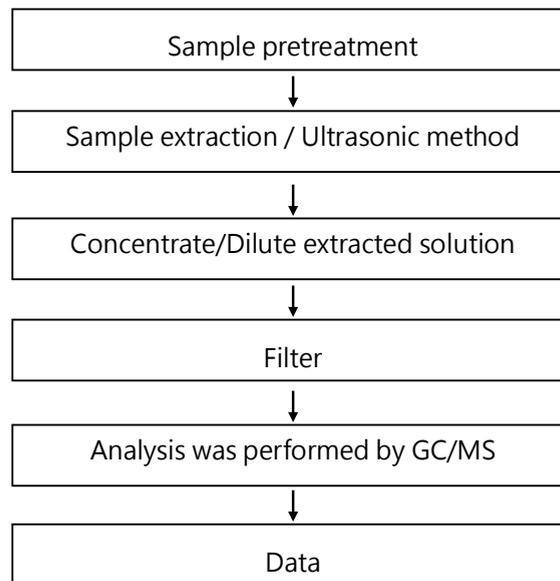
【Test method: IEC 62321-8】



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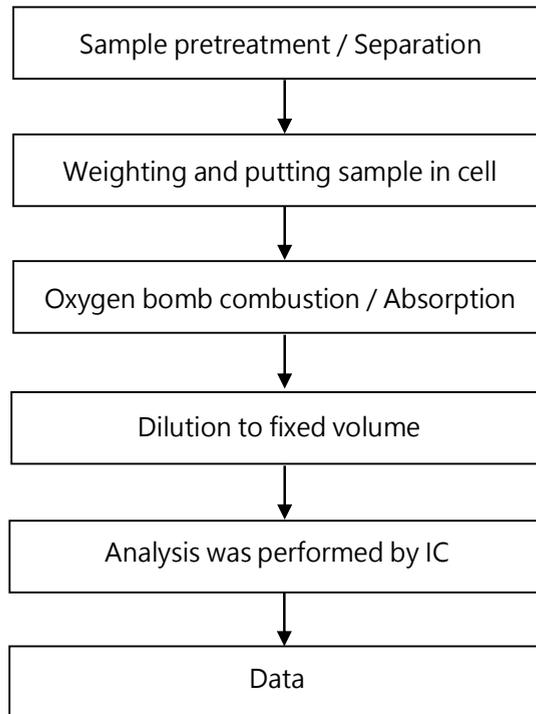
Analytical flow chart - HBCDD



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Analytical flow chart - Halogen

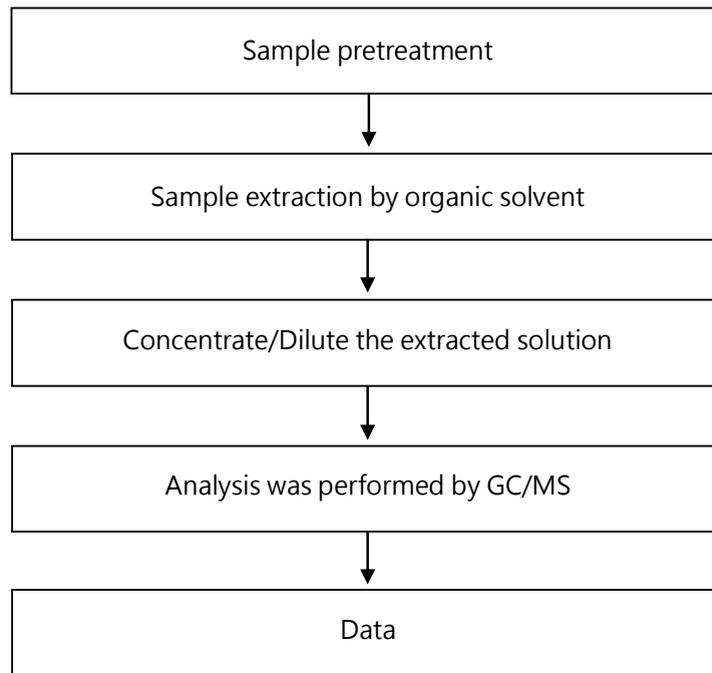


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Analytical flow chart

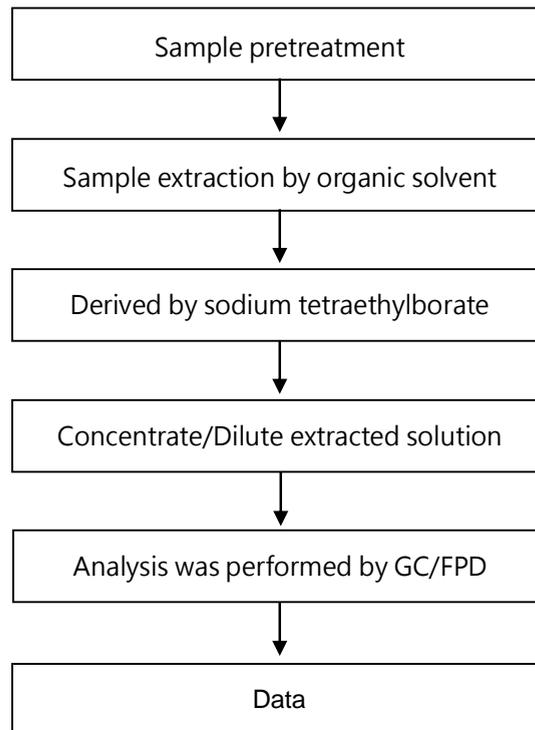
* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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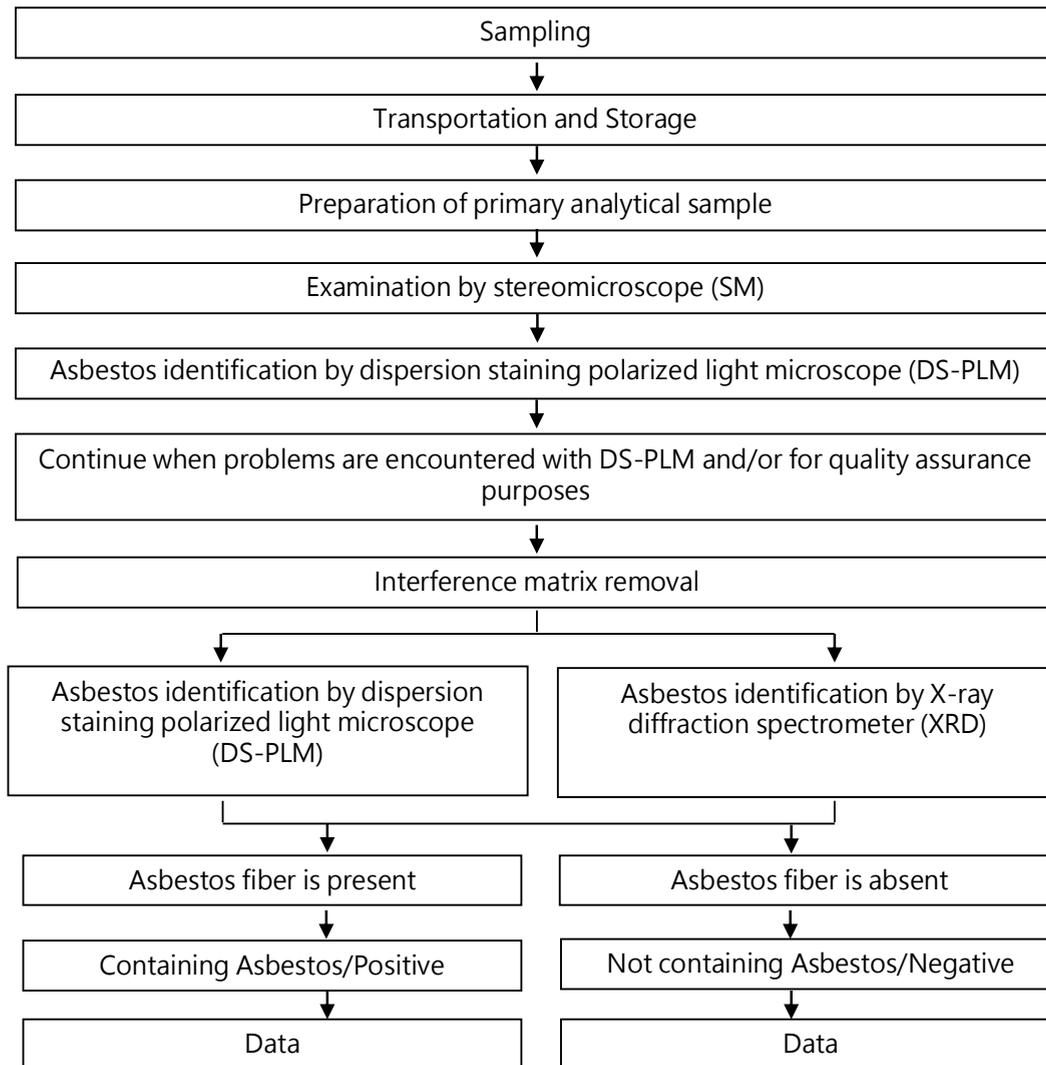
Analytical flow chart - Organic-Tin



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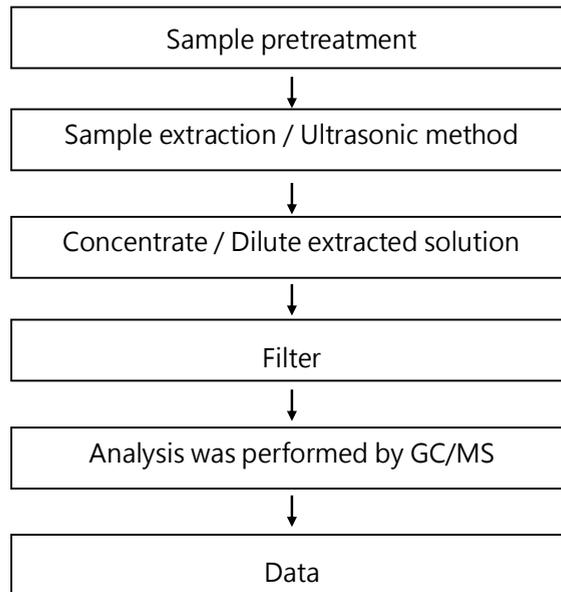
Analysis flow chart for determination of Asbestos
【Reference method: EPA 600/R-93/116】



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Analytical flow chart - Persistent, Bioaccumulative, Toxic (PBTs)

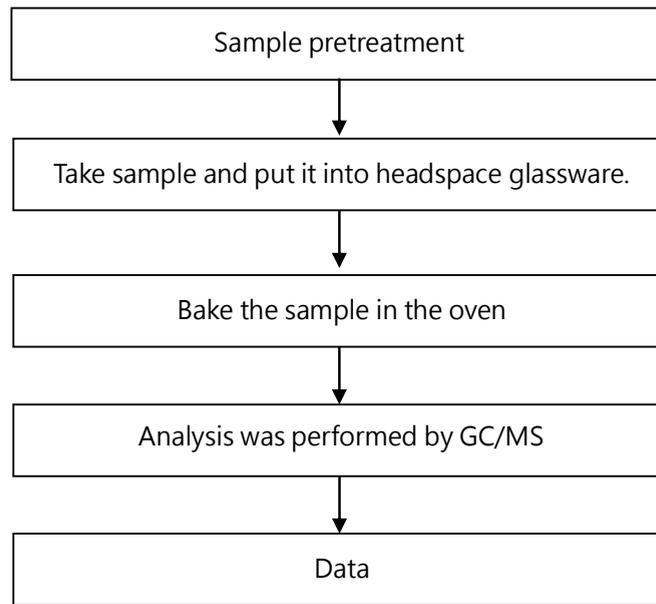


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Analytical flow chart of volatile organic compounds (VOCs)

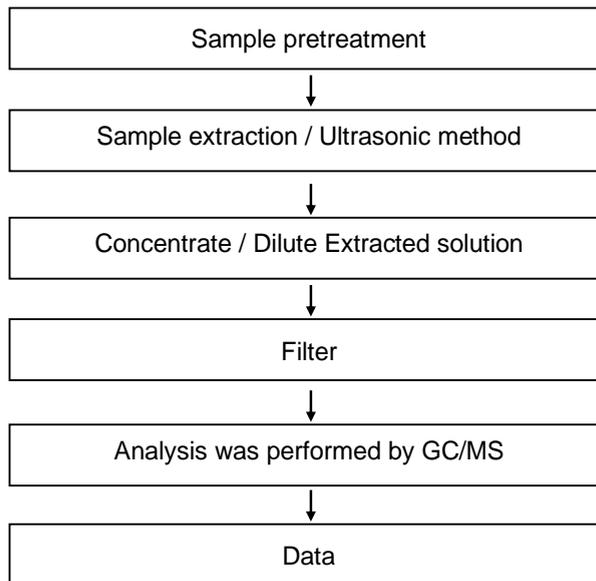
【 Reference method : US EPA 5021A 】



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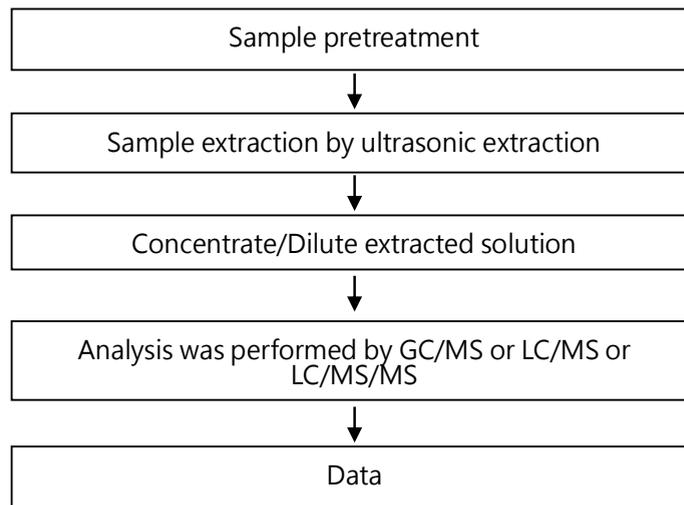
Analytical flow chart - Ethylene glycol ether



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



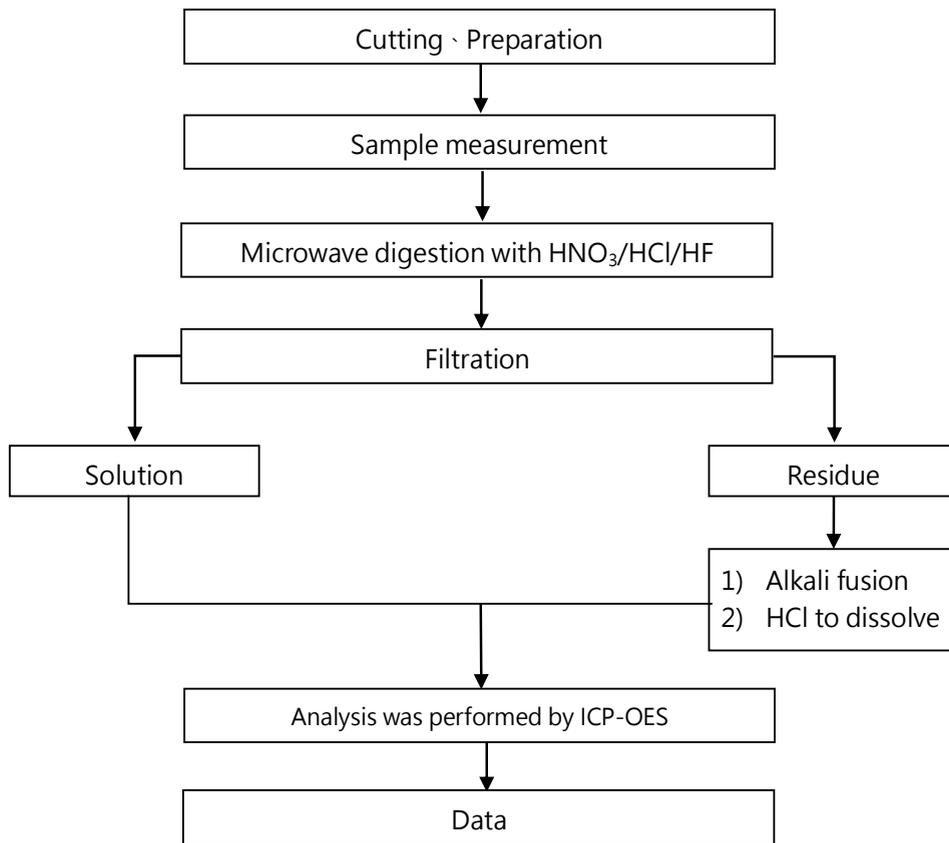
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Analytical flow chart of elements (Heavy metal included)

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

【Reference method : US EPA 3051A · US EPA 3052】

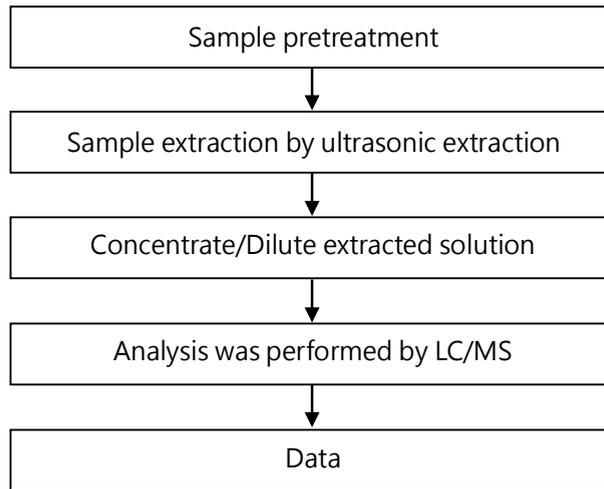


* US EPA 3051A method does not add HF.

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Analytical flow chart - TBBP-A

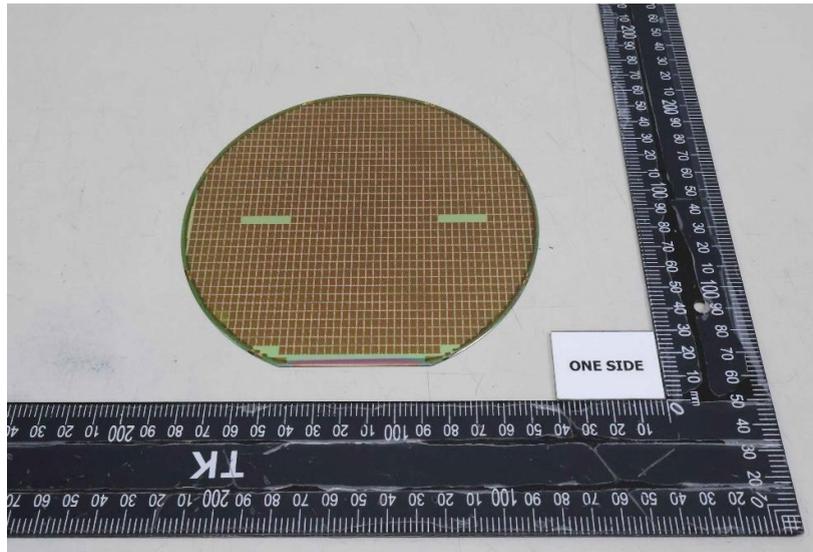


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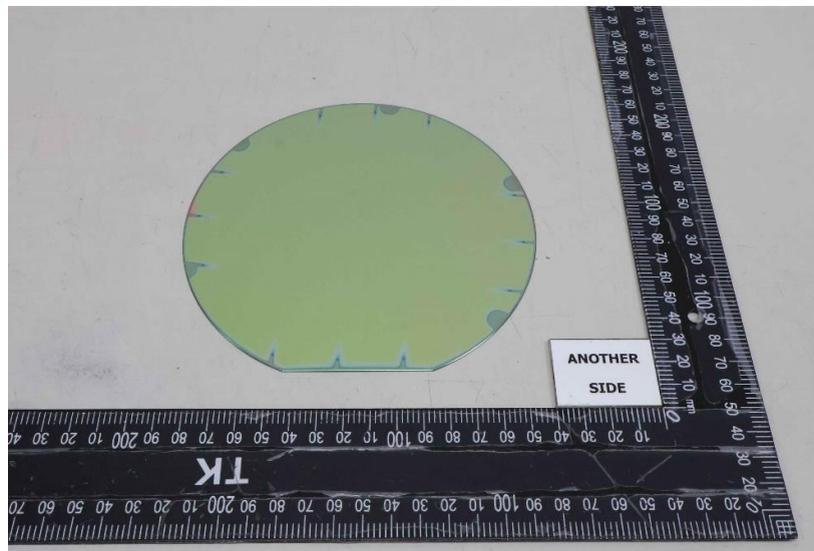
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

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** End of Report **

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