

YOUNG YIEL PRECISION CO., LTD

13, Beoman-ro 9-gil
Geumcheon-gu, Seoul
Korea



The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No. : AYAA23-36375
Product Name : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Client Reference Data : HEAT STIFFENER, SLUG, SINGLE WINDOW, FORGED LID, HAT TYPE, SINK
Received Date : 2023. 09. 07
Test Period : 2023. 09. 07 to 2023. 09. 14
Report Comments : By the applicant's request, item No.s/part No.s & client reference information are stated/added on report.
Test Results : For further details, please refer to following page(s)



Tonny Park Billy Oh

Technical Manager / SGS Korea Co., Ltd

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Test Report No. F690101/LF-CTSAYAA23-36375

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Sample No. : AYAA23-36375.001
Sample Description : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Materials : SUS304

Heavy Metals

| Test Items | Unit | Test Method | MDL | Results |
|------------------------------|--------------------|---|-----|---------|
| Cadmium (Cd) | mg/kg | With reference to IEC 62321-5 : 2013, by ICP-OES | 0.5 | N.D. |
| Lead (Pb) | mg/kg | With reference to IEC 62321-5 : 2013, by ICP-OES | 5 | N.D. |
| Mercury (Hg) | mg/kg | With reference to IEC 62321-4 : 2013+AMD1:2017CSV, by ICP-OES | 2 | N.D. |
| Hexavalent Chromium (Cr VI)* | µg/cm ² | With reference to IEC 62321-7-1 : 2015, by UV-Vis | 0.1 | N.D. |

Total Metals

| Test Items | Unit | Test Method | MDL | Results |
|----------------|-------|---|-----|---------|
| Antimony (Sb) | mg/kg | With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES | 10 | N.D. |
| Arsenic (As) | mg/kg | With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES | 10 | N.D. |
| Beryllium (Be) | mg/kg | With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES | 5 | N.D. |

Flame Retardants-PBBs/PBDEs

| Test Items | Unit | Test Method | MDL | Results |
|-------------------------|-------|--|-----|---------|
| Monobromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Dibromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Tribromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Tetrabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Pentabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Hexabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Heptabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Octabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Nonabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Decabromobiphenyl | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Monobromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |

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Item No./Part No. : N/A
Materials : SUS304

Flame Retardants-PBBs/PBDEs

| Test Items | Unit | Test Method | MDL | Results |
|--------------------------|-------|--|-----|---------|
| Dibromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Tribromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Tetrabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Pentabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Hexabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Heptabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Octabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Nonabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |
| Decabromodiphenyl ether | mg/kg | With reference to IEC 62321-6 : 2015, by GC-MS | 5 | N.D. |

Phthalates

| Test Items | Unit | Test Method | MDL | Results |
|---|-------|--|-----|---------|
| Di-(2-ethylhexyl) phthalate (DEHP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-butyl phthalate (DBP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Benzyl butyl phthalate (BBP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-isobutyl phthalate (DIBP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-isodecyl phthalate (DIDP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-isononyl phthalate (DINP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-n-octyl phthalate (DNOP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-n-hexyl phthalate (DNHP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| [di(C6-C8 alkyl)phthalate] branched (DIHP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| [di(C7-C11 alkyl)phthalate] linear and branched (DHNUP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |

Chlorinated Paraffin

| Test Items | Unit | Test Method | MDL | Results |
|--|-------|---|-----|---------|
| Alkanes, C10~13, Short Chain Chlorinated Paraffins(SCCP) | mg/kg | With reference to ISO 18219, by GC-MS(Cl) | 50 | N.D. |

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Chlorinated Organic Substances

| Test Items | Unit | Test Method | MDL | Results |
|-----------------------------------|-------|---|-----|---------|
| Polychlorinated Naphthalene (PCN) | mg/kg | With reference to US EPA 8081 A(US EPA 3550C), by GC/MS | 5 | N.D. |

PCBs & PCTs

| Test Items | Unit | Test Method | MDL | Results |
|-----------------------------------|-------|--|-----|---------|
| Polychlorinated Biphenyls (PCBs) | mg/kg | With reference to US EPA 8082,(US EPA 3550C), by GC/MS | 3 | N.D. |
| Polychlorinated terphenyls (PCTs) | mg/kg | With reference to US EPA 8082,(US EPA 3550C), by GC/MS | 3 | N.D. |

Polymer Identification

| Test Items | Unit | Test Method | MDL | Results |
|------------|------|-------------|-----|----------|
| PVC | ** | FT-IR | - | Negative |

Halogen Content

| Test Items | Unit | Test Method | MDL | Results |
|--------------|-------|---|-----|---------|
| Bromine(Br) | mg/kg | With reference to BS EN 14582 : 2016, by IC | 30 | N.D. |
| Chlorine(Cl) | mg/kg | With reference to BS EN 14582 : 2016, by IC | 30 | N.D. |
| Fluorine(F) | mg/kg | With reference to BS EN 14582 : 2016, by IC | 30 | N.D. |
| Iodine(I) | mg/kg | With reference to BS EN 14582 : 2016, by IC | 50 | N.D. |

Organotin Compounds

| Test Items | Unit | Test Method | MDL | Results |
|---------------------|-------|---------------------------------------|-----|---------|
| Tributyltin (TBT) | mg/kg | with reference to ISO 17353, by GC/MS | 1 | N.D. |
| Triphenyltin (TPhT) | mg/kg | with reference to ISO 17353, by GC/MS | 1 | N.D. |
| Dibutyltin (DBT) | mg/kg | with reference to ISO 17353, by GC/MS | 1 | N.D. |

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Item No./Part No. : N/A
Materials : SUS304

Organotin Compounds

| Test Items | Unit | Test Method | MDL | Results |
|-------------------------------|-------|---------------------------------------|-----|---------|
| Bis (tributyltin)oxide (TBTO) | mg/kg | with reference to ISO 17353, by GC/MS | 1 | N.D. |
| Dioctyltin(DOT) | mg/kg | with reference to ISO 17353, by GC/MS | 1 | N.D. |

PFAS (Per- and polyfluoroalkyl substances)

| Test Items | Unit | Test Method | MDL | Results |
|-------------------------------------|-------|--|-----|---------|
| Perfluorooctanesulfonic Acid (PFOS) | µg/kg | with reference to CEN/TS 15968 :2010, HPLC/MS/MS | 10 | N.D. |
| Perfluorootanoic acid (PFOA) | µg/kg | with reference to CEN/TS 15968 :2010, HPLC/MS/MS | 10 | N.D. |

Ozone Depleting Substances

| Test Items | Unit | Test Method | MDL | Results |
|--|-------|------------------------|-----|---------|
| Trichlorofluoromethane (CFC-11) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2,2-Tetrachloro-1,2-difluoroethane (CFC-112) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC-114) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Chloro-1,1,2,2,2-pentafluoroethane (CFC-115) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Dichlorodifluoromethane (CFC-12) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Chlorotrifluoromethane (CFC-13) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,3,3,3-Hexachloro-2,2-difluoropropane (CFC-212) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,3,3,3-Pentachloro-2,2,3-trifluoropropane (CFC-213) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,3-Trichloro-1,2,2,3,3-pentafluoropropane (CFC-215cb) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloro-1,1,2,3,3,3-hexafluoropropane (CFC-216) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Chloro-1,1,2,2,3,3,3-heptafluoropropane (CFC-217) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |

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Sample No. : AYAA23-36375.001
Sample Description : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Materials : SUS304

Ozone Depleting Substances

| Test Items | Unit | Test Method | MDL | Results |
|---|-------|------------------------|-----|---------|
| 1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2,2-Trichloro-1,1-difluoroethane (HCFC-122) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2-Trichloro-2-fluoroethane (HCFC-131) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloro-1,1-difluoroethane (HCFC-132b) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2-Chloro-1,1,1-trifluoroethane (HCFC-133a) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1-Dichloro-1-fluoroethane (HCFC-141b) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Chloro-1,1-difluoroethane (HCFC-142b) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Chloro-1-fluoroethane (HCFC-151) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Dichlorofluoromethane (HCFC-21) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Chlorodifluoromethane (HCFC-22) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,3,3-Trichloro-1,1,2,2-tetrafluoropropane (HCFC-224ca) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2-Chloro-1,1,1,3,3,3-hexafluoro-propane (HCFC-226da) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 3-Chloro-1,1,1-trifluoropropane (HCFC-253fb) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloro-2-fluoropropane (HCFC-261ba) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Chlorofluoromethane (HCFC-31) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Methyl bromide (Halon-1001) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Bromochloromethane (Halon-1011) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Dibromodifluoromethane (Halon-1202) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Bromochlorodifluoromethane (Halon-1211) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Bromotrifluoromethane (Halon-1301) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| | | | | |

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Sample No. : AYAA23-36375.001
Sample Description : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Materials : SUS304

Ozone Depleting Substances

| Test Items | Unit | Test Method | MDL | Results |
|--|-------|------------------------|-----|---------|
| 1,2-Dibromo-1,1,2,2-tetrafluoroethane (Halon-2402) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dibromo-1,1-difluoroethane (HBFC-132B2) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2-Bromo-1,1,1-trifluoroethane (HBFC-133B1) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Bromo-2-fluoroethane (HBFC-151B1) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Dibromofluoromethane (HBFC-21B2) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Bromodifluoromethane (HBFC-22B1) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Bromo-3-fluoropropane (HBFC-271B1) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Bromofluoromethane (HBFC-31B1) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,2,2-Pentafluoroethane (HFC-125) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2,2-Tetrafluoroethane (HFC-134) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,2-Tetrafluoroethane (HFC-134a) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2-Trifluoroethane (HFC-143) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1-Trifluoroethane (HFC-143a) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1-Difluoroethane (HFC-152a) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Fluoroform (HFC-23) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,3,3,3-Hexafluoropropane (HFC-236fa) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2,2,3-Pentafluoropropane (HFC-245ca) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,4-Dihydrooctafluorobutane (HFC-338) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Fluoromethane (HFC-41) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2-Perfluoromethylpentane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Carbon tetrafluoride | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Nonafluoro-2-(trifluoromethyl)butane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluoro-1-butane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluorobutane (Decafluorobutane) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluorocyclobutane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluoroethane (Hexafluoroethane) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluorohexane (Tetradecafluorohexane) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |

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Item No./Part No. : N/A
Materials : SUS304

Ozone Depleting Substances

| Test Items | Unit | Test Method | MDL | Results |
|--|-------|------------------------|-----|---------|
| Perfluoroisobutene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluoropentane (Dodecafluoropentane) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Perfluoropropane (Octafluoropropane) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,1,2-Tetrachloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2,2-Tetrachloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1,2-Trichloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1-Dichloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1-Dichloroethene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,1-Dichloropropene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2,3-Trichloropropane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,2-Dichloropropane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1,3-Dichloropropane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 2,2-Dichloropropane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Carbon tetrachloride | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Chloroethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Chloroform | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| cis-1,2-Dichloroethene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| cis-1,3-Dichloropropene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Dichloromethane | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Hexachlorobutadiene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Methyl chloride | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Methylchloroform | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Tetrachloroethene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| trans-1,2-Dichloroethene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| trans-1,3-Dichloropropene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Trichloroethylene | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| 1-Bromopropane (n-Propyl bromide) | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Sulfur hexafluoride | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |
| Trifluoromethyl iodide | mg/kg | EPA 5021A :2014, GC/MS | 1 | N.D. |

Flame Retardants

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Sample No. : AYAA23-36375.001
Sample Description : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Materials : SUS304

Flame Retardants

| Test Items | Unit | Test Method | MDL | Results |
|--------------------------------|-------|--|-----|---------|
| Tetrabromobisphenol A | mg/kg | With reference to US EPA 3540C, by GC-MS | 10 | N.D. |
| Hexabromocyclododecane (HBCDD) | mg/kg | With reference to USEPA 3540 C, by LC/MS | 5 | N.D. |

Azo Dyes

| Test Items | Unit | Test Method | MDL | Results |
|-----------------------------|-------|---|-----|---------|
| o-Toluidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2,4-Xylidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2,6-Xylidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| o-Anisidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| p-Chloroaniline | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| p-Cresidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2,4,5-Trimethylaniline | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4-Chloro-o-Toluidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2,4-Toluenediamine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2,4-Diaminoanisole | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2-Naphtylamine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 2-Amino-4-Nitrotoluene | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4-Aminodiphenyl | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4,4'-Oxydianiline | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| Benzidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4,4'-diaminodiphenylmethane | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |

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Sample No. : AYAA23-36375.001
Sample Description : SUS + Ni Plating HEAT SPREADER
Item No./Part No. : N/A
Materials : SUS304

Azo Dyes

| Test Items | Unit | Test Method | MDL | Results |
|---|-------|---|-----|---------|
| o-Aminoazotoluene | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 3,3-Dimethyl-4,4'-diaminodiphenyl methane | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 3,3-Dimethylbenzidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4,4'-Thiodianiline | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 3,3'-Dichlorobenzidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4,4'-Methylen-bis-(2-chloroaniline) | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 3,3-Dimethoxybenzidine | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |
| 4-Aminoazobenzene | mg/kg | With reference to EN 14362-1:2012, GC/MS & HPLC/DAD | 5 | N.D. |

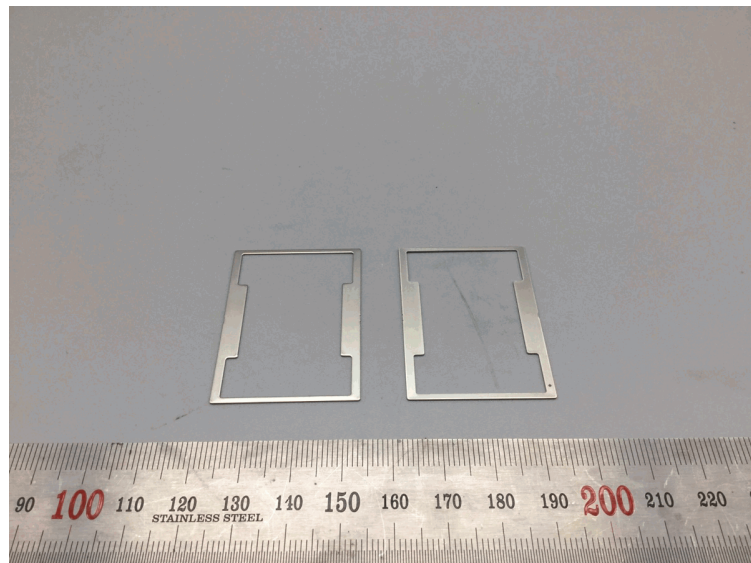
Other(s)

| Test Items | Unit | Test Method | MDL | Results |
|--|-------|---|-----|---------|
| 2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) | mg/kg | with reference to DIN EN 62321-6, GC/MS | 50 | N.D. |

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- NOTE:
- (1) N.D. = Not detected. (<MDL)
 - (2) mg/kg = ppm, ug/kg = ppb, mg/L = ppm
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) ** = Qualitative analysis (No Unit)
 - (6) Negative = Undetectable / Positive = Detectable
 - (7) * = a. The sample is positive for Cr VI if the Cr VI concentration is greater than 0.13 ug/cm².
 The sample coating is considered to contain Cr VI.
 b. The sample is negative for Cr VI if Cr VI is ND(concentration less than 0.10 ug/cm²).
 The coating is considered a non-Cr VI based coating.
 c. The result between 0.10 ug/cm² and 0.13 ug/cm² is considered to be inconclusive – unavoidable coating variations may influence the determination.
 - (8) The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 This test report is not related to Korea Laboratory Accreditation Scheme .

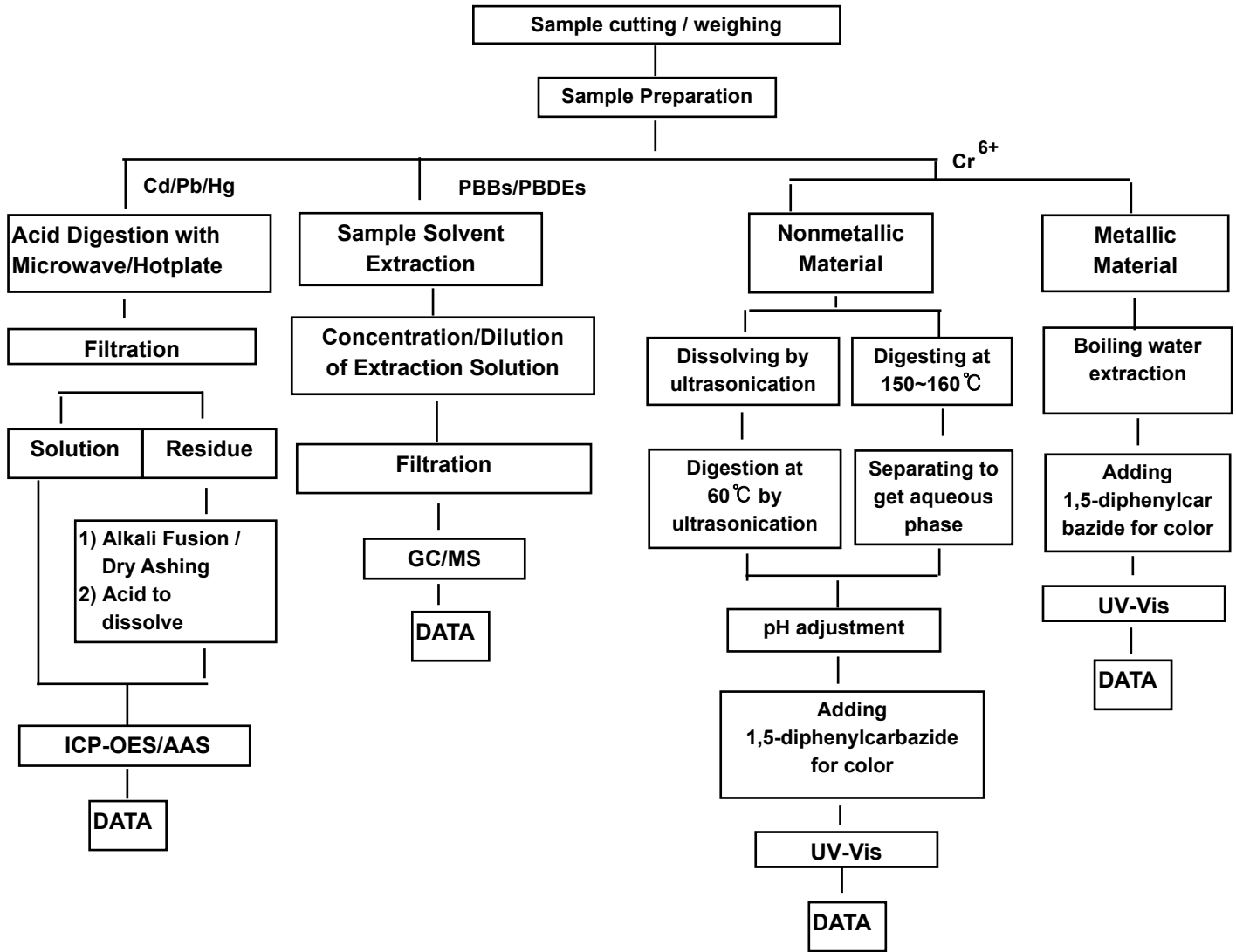
Picture of Sample as Received:



AYAA23-36375.001

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Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr⁶⁺ /PBBs&PBDEs Testing



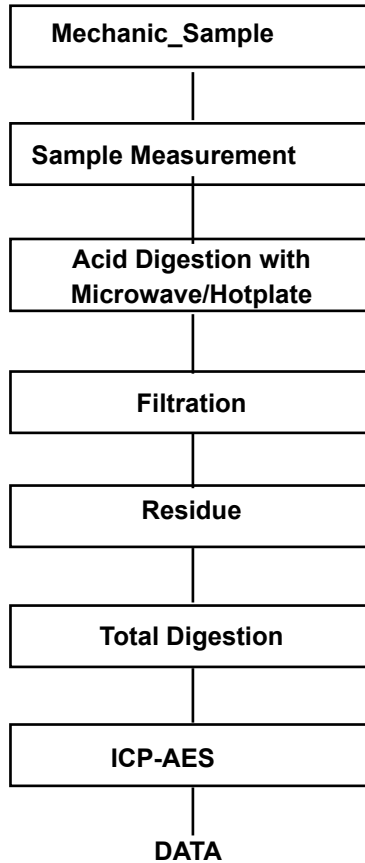
The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg
Section Chief : Tonny Park

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Flow Chart for Inorganic Elements Testing

Inorganic Elements

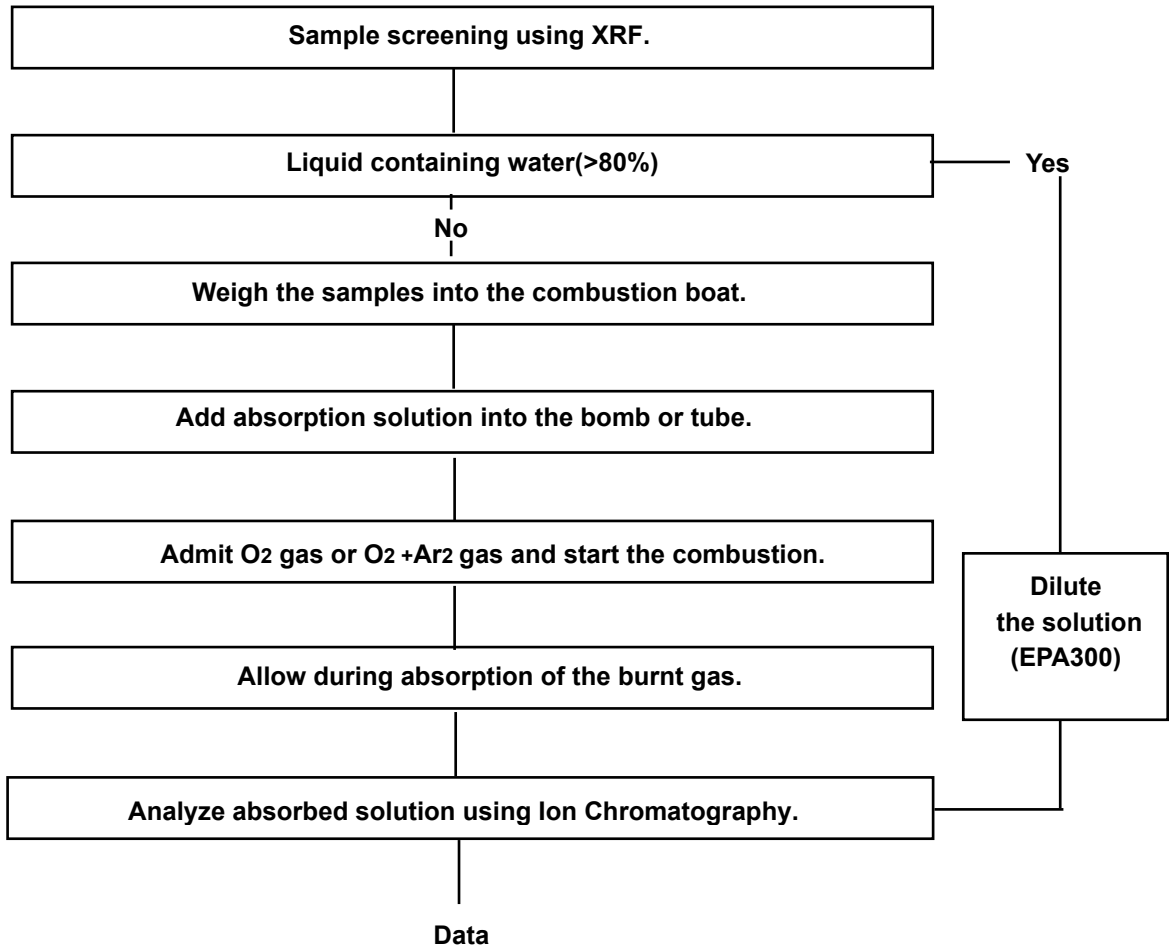


| | |
|------------------------------|---|
| Major Inorganic Heavy Metals | Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc. |
|------------------------------|---|

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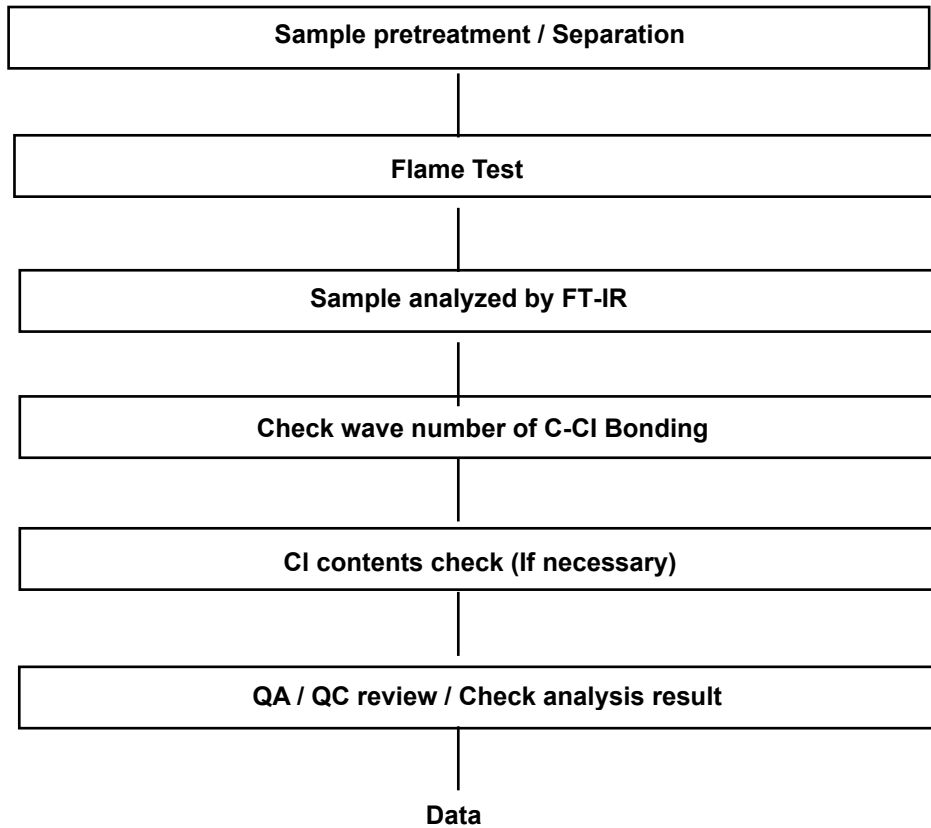
Flow Chart for Halogen Test



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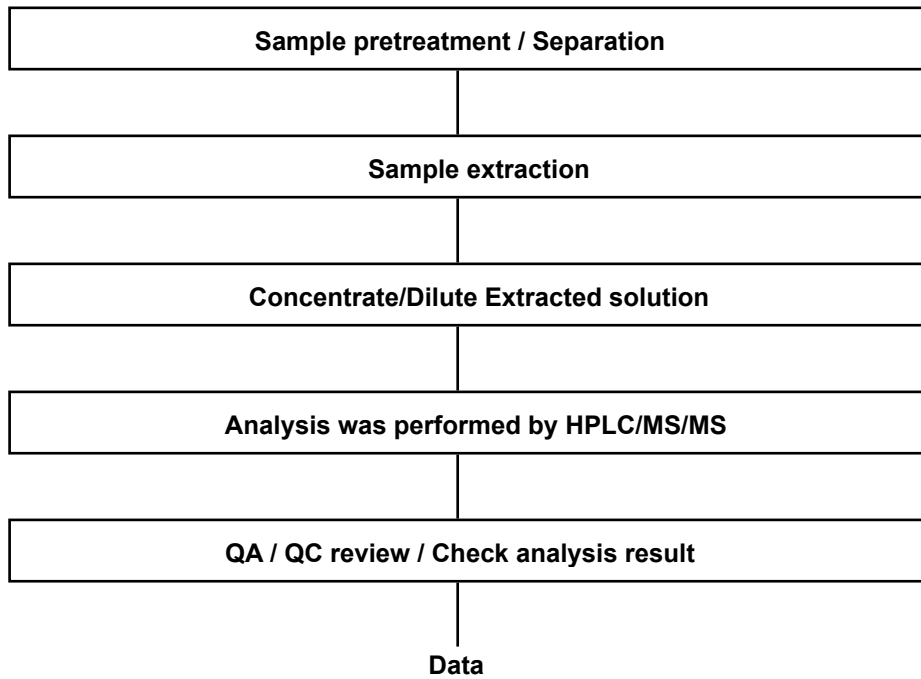
Flow Chart for PVC Test



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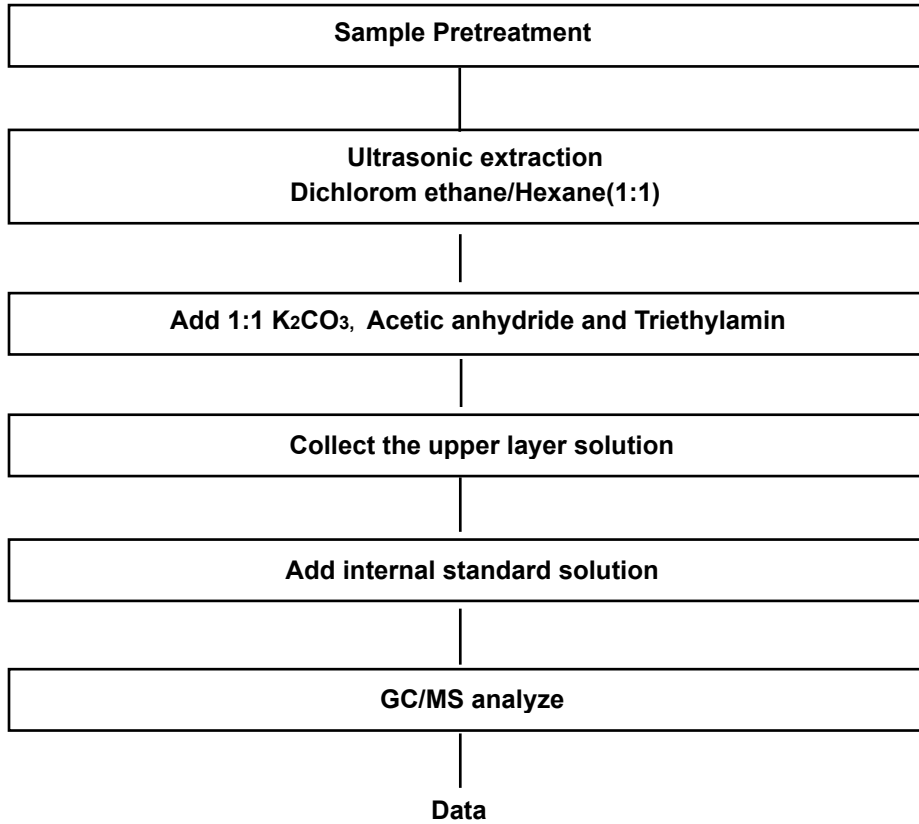
Flow Chart for PFOS/PFOA Test



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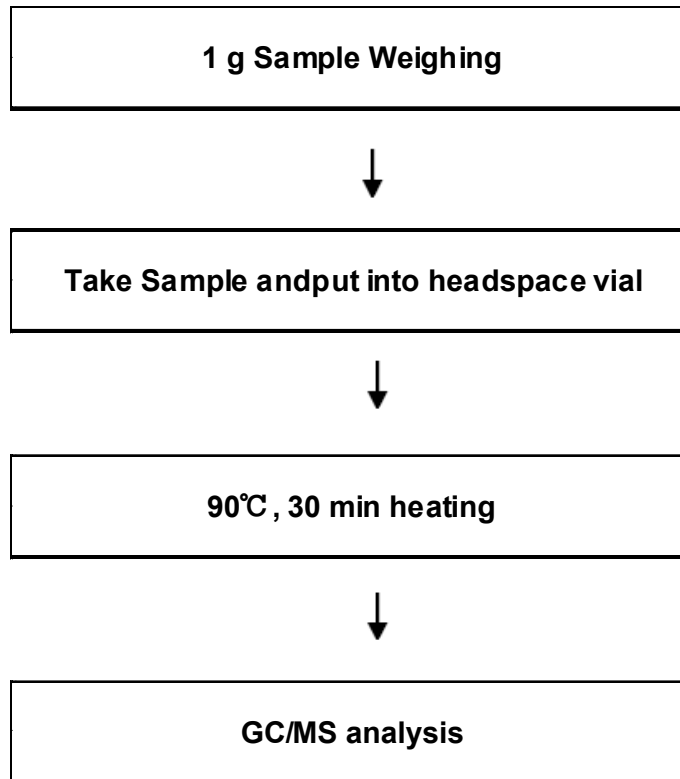
Flow Chart for TBBPA Test



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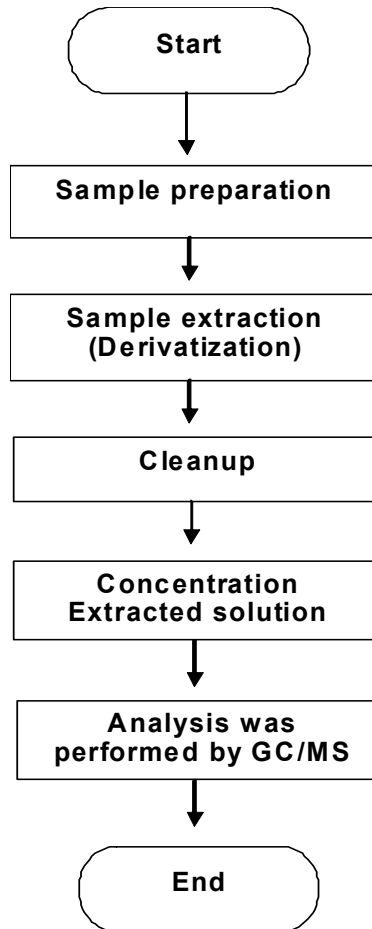
ODS Analysis Flow Chart



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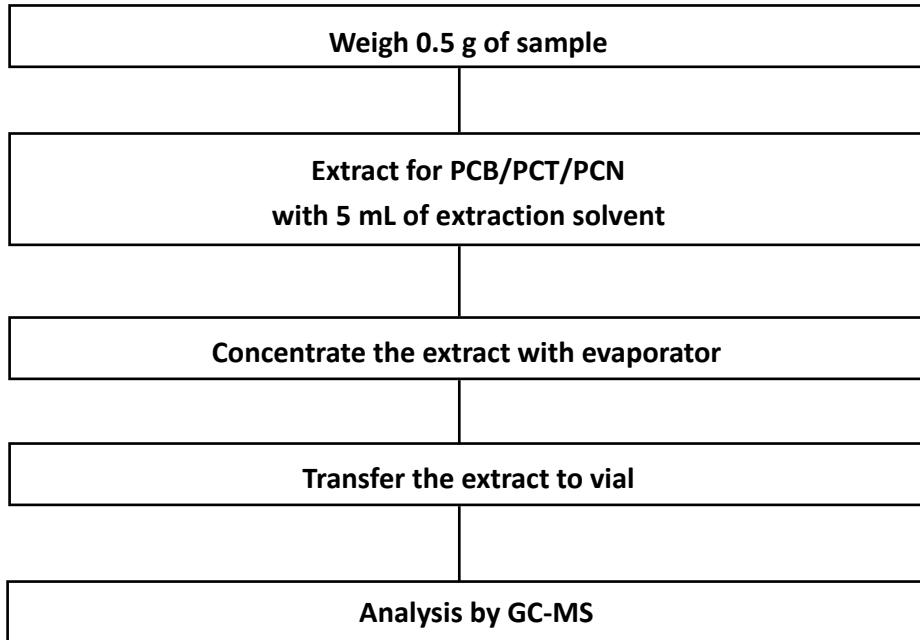
Organotin Flow Chart



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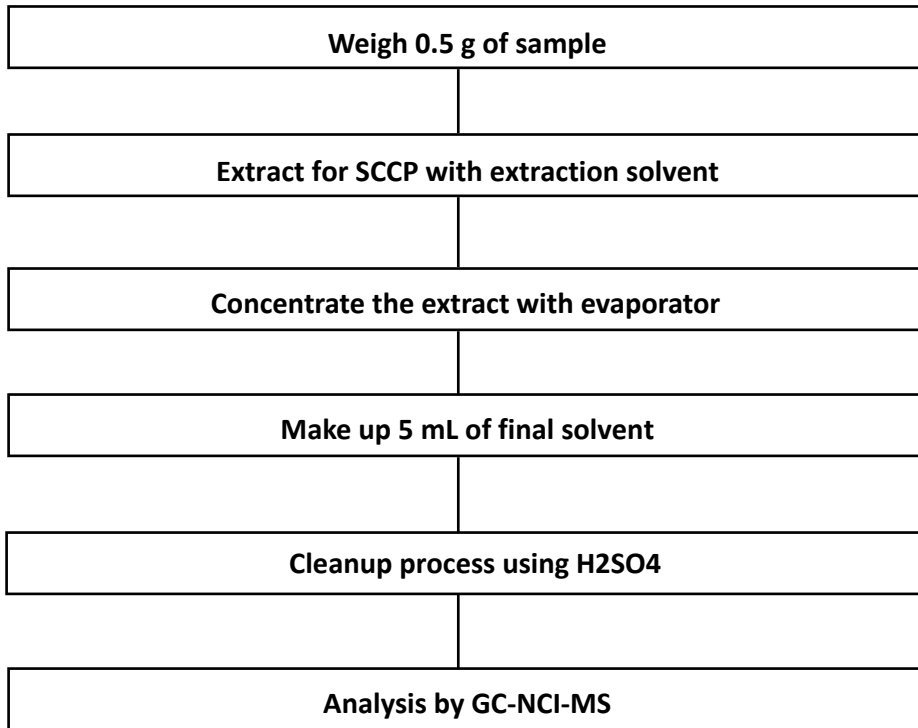
Flow Chart for (PCB/PCT/PCN)



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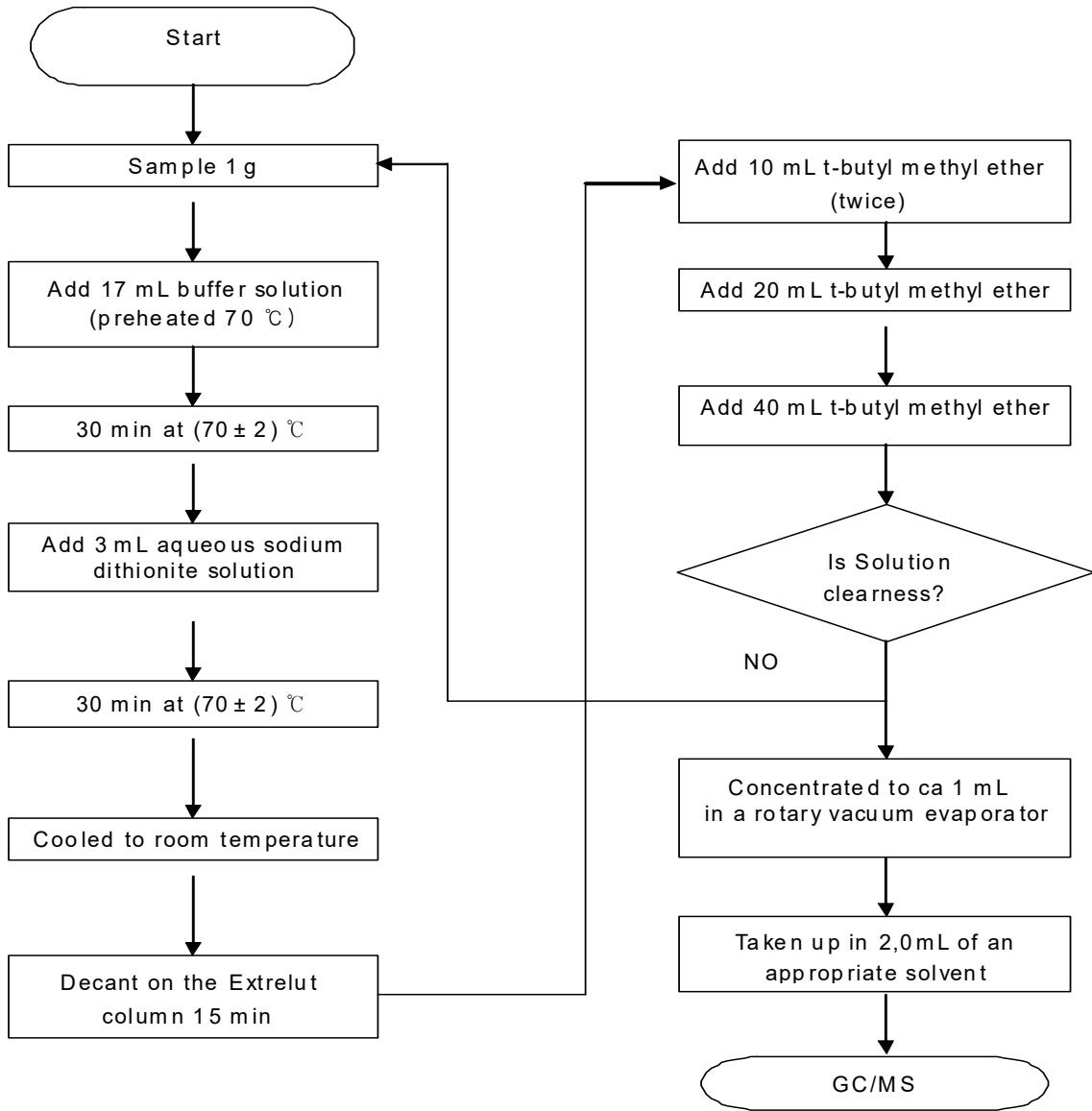


Flow Chart for SCCP



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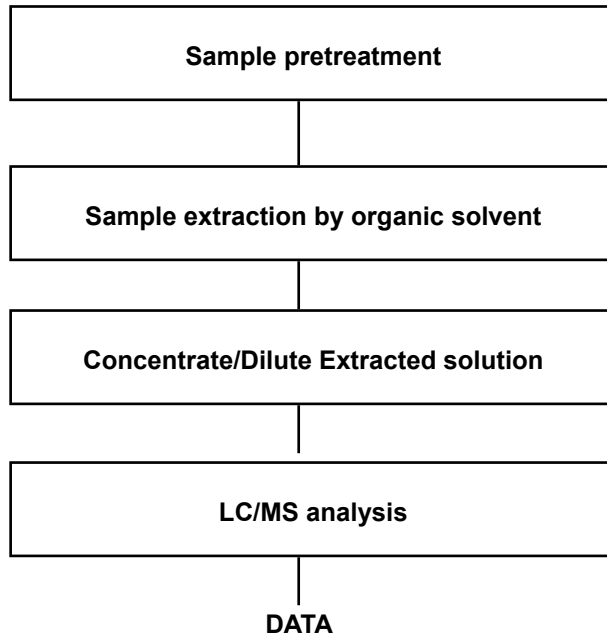
AZO Flow Chart



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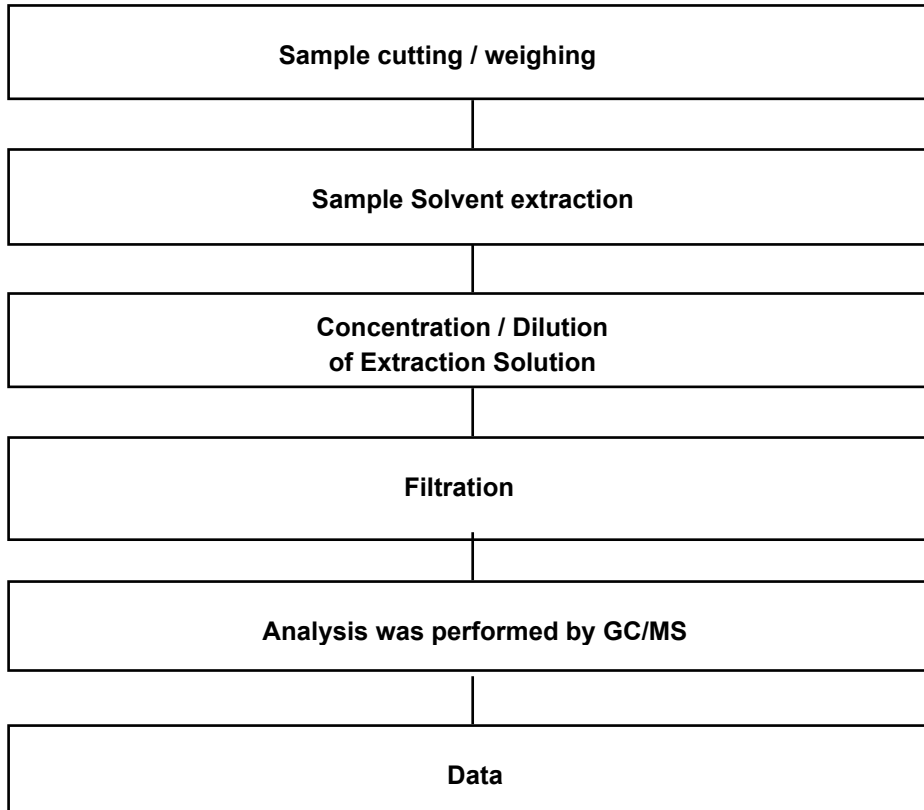
Testing Flow Chart for HBCD



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Flow Chart for Phthalate Test



*** End of Report ***

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