# Test Report

**No.:** SHAEC23008469701 **Date:** Jun 28, 2023 

Client Name: Ningbo Kangqiang Electronics Co., Ltd.

Client Address: 988 Jinyuan Road, Yinzhou Investment and Entrepreneurship Center, Ningbo City, Zhejiang Province, China

Sample Name: Lead Frame （A194，Other name：C194、C19400、XYK-4、QFE2.5）

Model No.: SOP

Client Ref. Information: SOP、SIP、SDIP、HDIP、SOIC、DIP、SSOP、SOT、TSOP、TSSOP、MSOP、ESOP、HSOP、TO、SMD、PD、LQFP、LF、SOD、GBU、SCMA、PMSOP、EMSOP、QFN、DFN、PDFN、Power DI、LED、MFP、QT、TSOT、HAL、MCS、SM、SOL、ST、TMP、MLF、FBP、ELP、QLMP、OCSSOP、T/SLP、LPCC、QFP、MISPP、MPAQ、CMD、SW93、SME\EMC 、PD、SMA、SMB、SMF、VER、JSQ、PDIP、ESSOP、QSOP、CPC Lead Frame

The above sample(s) and information were provided by the client.

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SGS Job No.: TIC1020230616170357RF6O

Sample Receiving Date: Jun 19, 2023

Testing Period: Jun 19, 2023 ~ Jun 28, 2023

Test Requested: Select test(s) as requested by the client.

Test Method(s): Please refer to next page(s).

Test Result(s): Please refer to next page(s).

| Test Requirement | Conclusion |
|---|---|
| EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) | Pass |
| Halogen | See Results |
| Phthalates | See Results |
| TBBP-A | See Results |

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Carol Luo
Approved Signatory

scan to see the report
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| Test Requirement | Conclusion |
|---|---|
| Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts | See Results |
| Polycyclic Aromatic Hydrocarbons (PAHs) | See Results |

**Test Result(s):**

Test Part Description：

| SN ID | Sample No. | SGS Sample ID | Description |
|---|---|---|---|
| SN1 | A1 | SHA23-0084697-0001.C001 | Copper metal |

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%
(2) MDL = Method Detection Limit
(3) ND = Not Detected (< MDL)
(4) "-" = Not Regulated

**EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)**

Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES, AAS,UV-Vis and GC-MS.

| Test Item(s) | Limit | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| Cadmium(Cd) | 100 | mg/kg | 2 | ND |
| Lead(Pb) | 1000 | mg/kg | 2 | ND |
| Mercury(Hg) | 1000 | mg/kg | 2 | ND |
| Hexavalent Chromium (Cr(VI))▼ | - | µg/cm² | 0.10 | ND |
| Polybromobiphenyl (PBBs) | 1000 | mg/kg | - | ND |
| Monobromobiphenyl (MonoBB) | - | mg/kg | 5 | ND |
| Dibromobiphenyl (DiBB) | - | mg/kg | 5 | ND |
| Tribromobiphenyl (TriBB) | - | mg/kg | 5 | ND |
| Tetrabromobiphenyl (TetraBB) | - | mg/kg | 5 | ND |
| Pentabromobiphenyl (PentaBB) | - | mg/kg | 5 | ND |
| Hexabromobiphenyl (HexaBB) | - | mg/kg | 5 | ND |
| Heptabromobiphenyl (HeptaBB) | - | mg/kg | 5 | ND |
| Octabromobiphenyl (OctaBB) | - | mg/kg | 5 | ND |
| Nonabromobiphenyl (NonaBB) | - | mg/kg | 5 | ND |
| Decabromobiphenyl (DecaBB) | - | mg/kg | 5 | ND |
| Polybromodiphenyl ether(PBDEs) | 1000 | mg/kg | - | ND |
| Monobromodiphenylether (MonoBDE) | - | mg/kg | 5 | ND |
| Dibromodiphenylether (DiBDE) | - | mg/kg | 5 | ND |
| Tribromodiphenylether (TriBDE) | - | mg/kg | 5 | ND |
| Tetrabromodiphenylether (TetraBDE) | - | mg/kg | 5 | ND |
| Pentabromodiphenylether (PentaBDE) | - | mg/kg | 5 | ND |
| Hexabromodiphenylether (HexaBDE) | - | mg/kg | 5 | ND |
| Heptabromodiphenylether (HeptaBDE) | - | mg/kg | 5 | ND |



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| Test Item(s) | Limit | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| Octabromodiphenylether (OctaBDE) | - | mg/kg | 5 | ND |
| Nonabromodiphenylether (NonaBDE) | - | mg/kg | 5 | ND |
| Decabromodiphenylether (DecaBDE) | - | mg/kg | 5 | ND |
| Dibutyl Phthalate(DBP) | 1000 | mg/kg | 50 | ND |
| Benzyl Butyl Phthalate(BBP) | 1000 | mg/kg | 50 | ND |
| Bis-(2-ethylhexyl) Phthalate(DEHP) | 1000 | mg/kg | 50 | ND |
| Diisobutyl Phthalate(DIBP) | 1000 | mg/kg | 50 | ND |

**Notes:**
(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
(2) IEC 62321 series is equivalent to EN 62321 series.
(3) ▼ = a. The sample is positive for Cr(VI) if the Cr(VI)concentration is greater than 0.13 μg/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 μg/cm²). The coating is considered a non-Cr(VI) based coating
c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive-unavoidable coating variations may influence the determination Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing. Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

**Halogen**

Test Method: With reference to EN 14582:2016, analysis was performed by IC.

| Test Item(s) | Unit(s) | MDL | A1 |
|---|---|---|---|
| Fluorine(F) | mg/kg | 20 | ND |
| Chlorine(Cl) | mg/kg | 50 | ND |
| Bromine(Br) | mg/kg | 50 | ND |
| Iodine(I) | mg/kg | 50 | ND |

**Phthalates**

Test Method: With reference to IEC 62321-8:2017, analysis was performed by GC-MS.

| Test Item(s) | CAS No. | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| Diisononyl Phthalate (DINP) | 28553-12-0 /68515-48-0 | mg/kg | 50 | ND |
| Di-n-Octyl Phthalate(DNOP) | 117-84-0 | mg/kg | 50 | ND |
| Diisodecyl Phthalate (DIDP) | 26761-40-0 /68515-49-1 | mg/kg | 50 | ND |

**TBBP-A**

Test Method: With reference to US EPA 3540C:1996, analysis was performed by GC-MS/LC-MS.

| Test Item(s) | CAS No. | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| TBBP-A | 79-94-7 | mg/kg | 10 | ND |

**Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts**

Test Method: With reference to CEN/TS 15968:2010, analysis was performed by HPLC-MS or LC-MS/MS.

| Test Item(s) | CAS No. | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| PFOS and its derivatives | - | mg/kg | - | ND |
| Perfluorooctane Sulfonates (PFOS) and its salts* | - | mg/kg | 0.010 | ND |
| N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA) | 4151-50-2 | mg/kg | 0.010 | ND |
| N-methylperfluoro-1-octanesulfonamide (N-MeFOSA) | 31506-32-8 | mg/kg | 0.010 | ND |
| 2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol (N-EtFOSE) | 1691-99-2 | mg/kg | 0.010 | ND |
| 2-(N-methylperfluoro-1-octanesulfonamido) -ethanol (N-MeFOSE) | 24448-09-7 | mg/kg | 0.010 | ND |
| Perfluorooctane Sulfonamide (PFOSA) | 754-91-6 | mg/kg | 0.010 | ND |
| Perfluorooctanoic Acid (PFOA) and its salts* | - | mg/kg | 0.010 | ND |

**Notes:**
(1) Perfluorooctanoic acid (PFOA) and its salts* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.
(2) Perfluorooctane sulfonates (PFOS) and its salts* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-$NH_4$ (CAS No. 29081-56-9), PFOS-$N(C_{10}H_{21})_2(CH_3)_2$ (CAS No. 251099-16-8), PFOS-$NH_2(C_2H_4OH)_2$ ( CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-$N(C_2H_5)_4$ (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.

**Polycyclic Aromatic Hydrocarbons (PAHs)**

Test Method: With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

| Test Item(s) | CAS No. | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| Benzo(a)pyrene(BaP) | 50-32-8 | mg/kg | 0.1 | ND |
| Benzo(e)pyrene(BeP) | 192-97-2 | mg/kg | 0.1 | ND |
| Benzo(a)anthracene(BaA) | 56-55-3 | mg/kg | 0.1 | ND |
| Benzo(b)Fluoranthene(BbF) | 205-99-2 | mg/kg | 0.1 | ND |
| Benzo(j)fluoranthene(BjF) | 205-82-3 | mg/kg | 0.1 | ND |
| Benzo(k)Fluoranthene(BkF) | 207-08-9 | mg/kg | 0.1 | ND |


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| Test Item(s) | CAS No. | Unit(s) | MDL | A1 |
|---|---|---|---|---|
| Chrysene(CHR) | 218-01-9 | mg/kg | 0.1 | ND |
| Dibenzo(a,h)Anthracene(DBA) | 53-70-3 | mg/kg | 0.1 | ND |
| Benzo(g,h,i)perylene(BPE) | 191-24-2 | mg/kg | 0.1 | ND |
| Indeno(1,2,3-c,d)pyrene(IPY) | 193-39-5 | mg/kg | 0.1 | ND |
| Phenanthrene(PHE) | 85-01-8 | mg/kg | 0.1 | ND |
| Pyrene(PYR) | 129-00-0 | mg/kg | 0.1 | ND |
| Anthracene(ANT) | 120-12-7 | mg/kg | 0.1 | ND |
| Fluoranthene(FLT) | 206-44-0 | mg/kg | 0.1 | ND |
| Sum of Phenanthrene(PHE), Pyrene(PYR), Anthracene(ANT), Fluoranthene(FLT) | - | mg/kg | - | ND |
| Naphthalene(NAP) | 91-20-3 | mg/kg | 0.1 | ND |
| Sum of 15 PAHs | - | mg/kg | - | ND |
| Material Category | - | - | - | - |

**Notes:**

**AfPS（German commission for Product Safety）: PAHs requirements**

| Parameter | Category 1 | Category 2 | | Category 3 | |
|---|---|---|---|---|---|
| | Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use -in toys according to Directive 2009/48/EC or -for the use by children[a,b] up to 3 years of age. | Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact[c] with skin during the intended or foreseeable use[d]. | | Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use. | |
| | | a. use by children | b. other consumer products | a. use by children | b. other consumer products |
| Benzo(a)pyrene (BaP) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Benzo(e)pyrene (BeP) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Benzo(a)anthracene (BaA) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Benzo(b)fluoranthene (BbF) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |


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| | | | | | |
|---|---|---|---|---|---|
| Benzo(j)fluoranthene (BjF) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Benzo(k)fluoranthene (BkF)mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Chrysene (CHR) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Dibenzo(a,h)anthracene (DBA) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Benzo(g,h,i)perylene (BPE) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Indeno(1,2,3-cd)pyrene (IPY) mg/kg | < 0.2 | < 0.2 | < 0.5 | < 0.5 | < 1 |
| Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT), mg/kg | < 1 Sum | < 5 Sum | < 10 Sum | < 20 Sum | < 50 Sum |
| Naphthalene (NAP) mg/kg | < 1 | < 2 | | < 10 | |
| **Sum of 15 PAHs** | <1 | < 5 | < 10 | < 20 | < 50 |

Notes:
[a] A “Child” is legally defined as a person before reaching the age of 14 years.
[b] Use by children includes both active and passive contact by children.
[c] Definition “short-term repetitive contact” taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No.1272/2013)
[d] According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) “foreseeable use” shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.

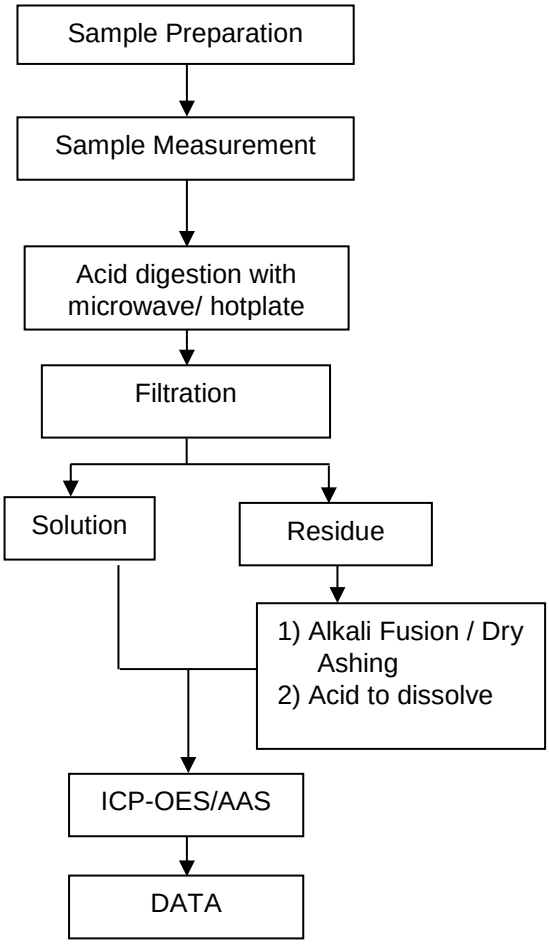
Remark:
The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

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.

**ATTACHMENTS**

**Elements Testing Flow Chart**

Name of the person who made testing: Meria Jin/Sielina Song
Name of the person in charge of testing: Luna Xu/Bob Zhang
These samples were dissolved totally by pre-conditioning method according to below flow chart.



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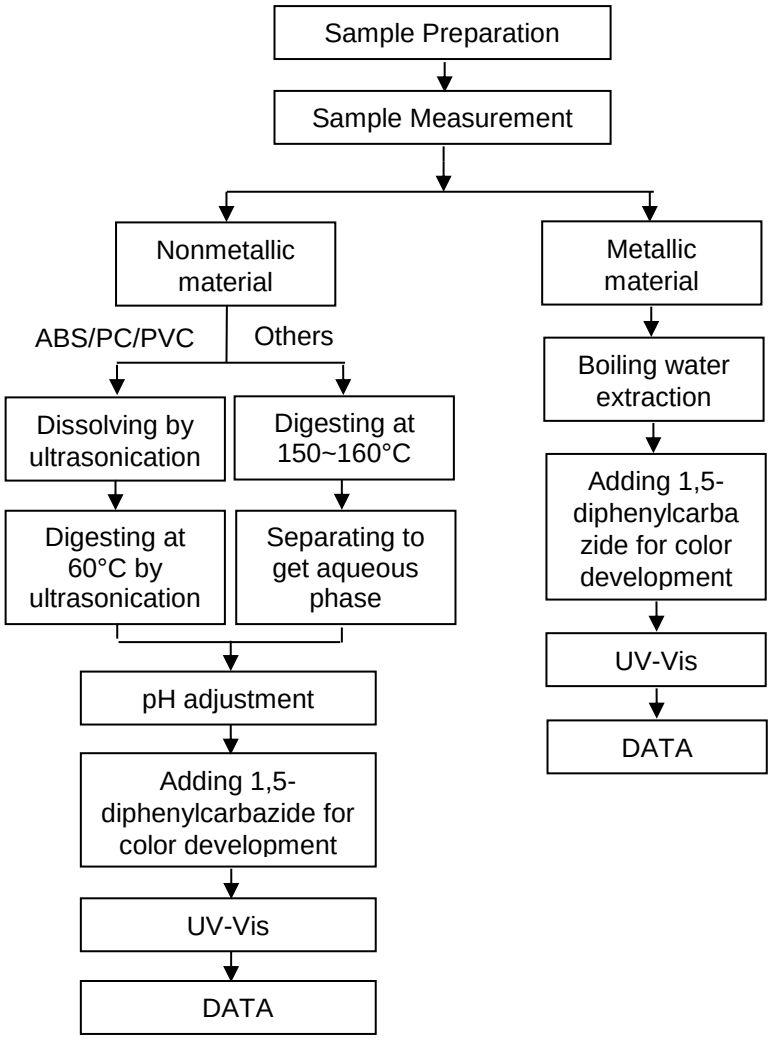
## ATTACHMENTS

### Hexavalent Chromium (Cr(VI)) Testing Flow Chart

Name of the person who made testing: Alex Wang
Name of the person in charge of testing: Xiaolong Yang



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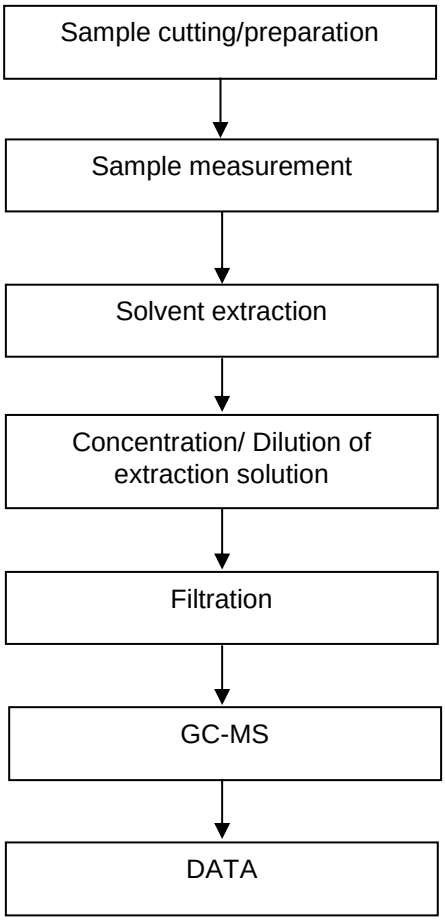
**ATTACHMENTS**

**PBBs/PBDEs Testing Flow Chart**

Name of the person who made testing: Gary Xu
Name of the person in charge of testing: Brin Feng



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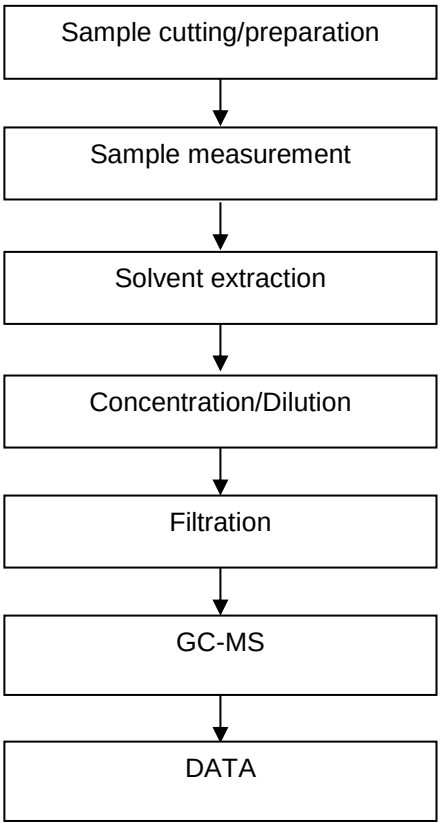
**Phthalates Testing Flow Chart**

Name of the person who made testing: Iris Han
Name of the person in charge of testing: Jason Zhang



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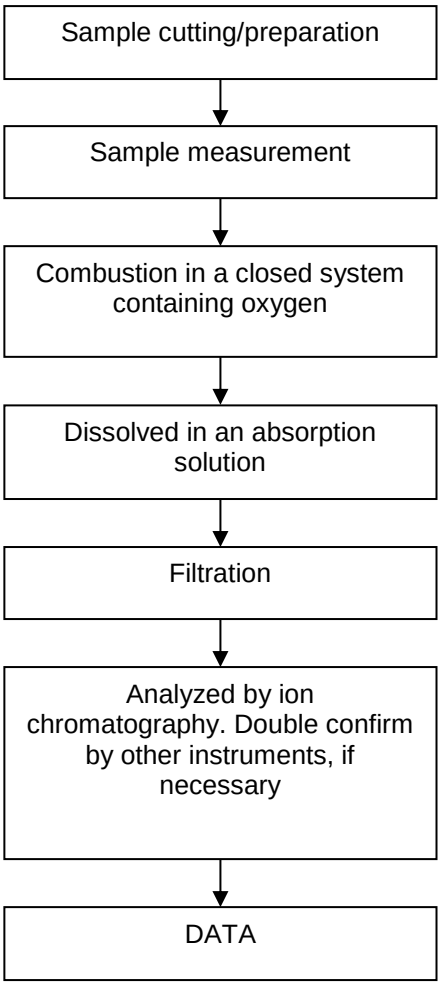
### Halogen Testing Flow Chart

Name of the person who made testing: Andy Zhang
Name of the person in charge of testing: Allen Chen



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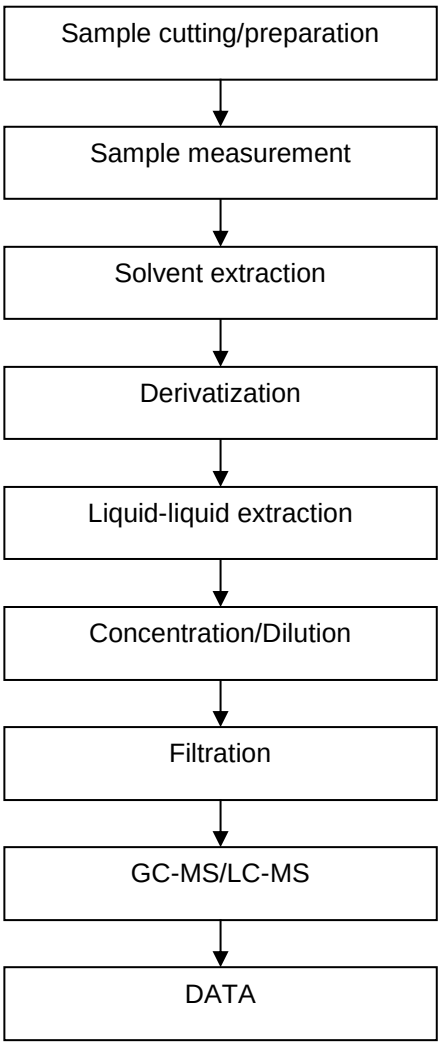
### TBBP-A Testing Flow Chart

Name of the person who made testing: Gary Xu
Name of the person in charge of testing: Jason Zhang



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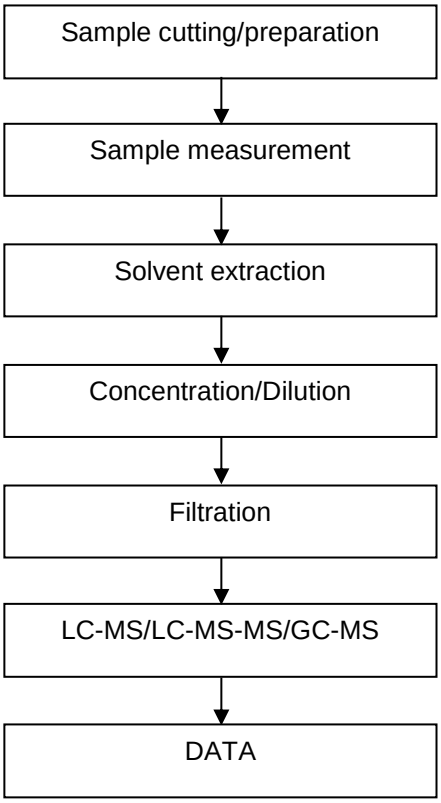
### PFASs/ PFOS/PFOA Testing Flow Chart

Name of the person who made testing: Mia Zeng
Name of the person in charge of testing: Richer Yu



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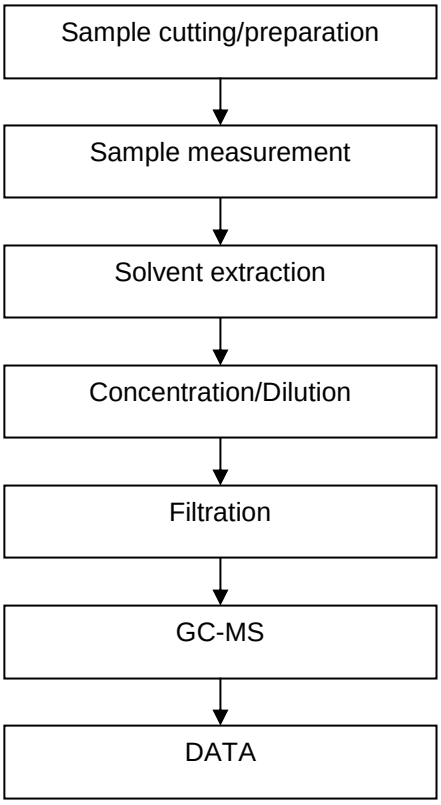
### PAHs Testing Flow Chart

Name of the person who made testing: Nina Fang
Name of the person in charge of testing: Leon Tang



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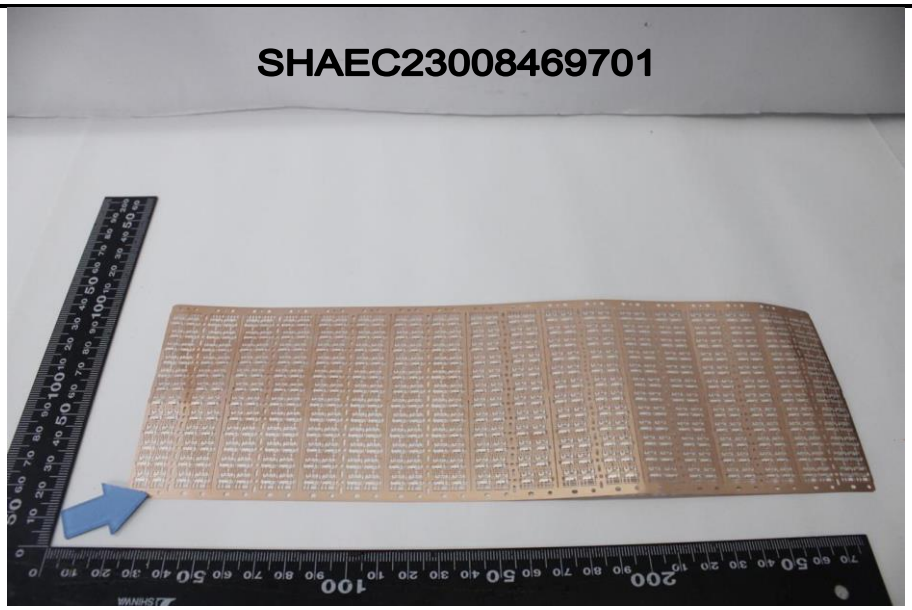
**Sample Photo:**




SHA23-0084697-0001.C001

SGS authenticate the photo on original report only

*** End of Report ***



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