

SAMHWA NON-FERROUS METAL

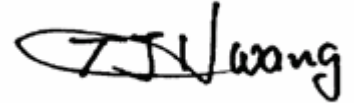
156 Ojanggal-gil, Gunbuk-myeon
Haman-gun, Gyeongnam
Korea



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

SGS File No. : AYGU18-09545
Product Name : PF142 BAR
Item No./Part No. : N/A
Received Date : 2018. 12. 28
Test Period : 2018. 12. 28 to 2019. 01. 03
Test Results : For further details, please refer to following page(s)

SGS Korea Co., Ltd.
/ LTS Busan Laboratory



Thomas Hwang / Lab Manager

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Test Report No. F690101/LF-CTSAYGU18-09545

Issued Date : 2019. 01. 03

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Sample No. : AYGU18-09545.001
 Sample Description : PF142 BAR
 Item No./Part No. : N/A
 Materials : Sn99.3%, Cu0.7%

Heavy Metals

| Test Items | Unit | Test Method | MDL | Results |
|-------------------------------|--------------------|---|-----|---------|
| Cadmium (Cd) | mg/kg | With reference to IEC 62321-5:2013(Determination of Cadmium by ICP-OES) | 0.5 | N.D. |
| Lead (Pb) | mg/kg | With reference to IEC 62321-5:2013(Determination of Lead by ICP-OES) | 5 | 181 |
| Mercury (Hg) | mg/kg | With reference to IEC 62321-4:2013(Determination of Mercury by ICP-OES) | 2 | N.D. |
| Hexavalent Chromium (Cr VI) * | µg/cm ² | With reference to IEC 62321-7-1:2015 (Determination of CrVI by UV-Vis) | 0.1 | N.D. |
| Antimony (Sb) | mg/kg | With reference to EPA 3052(1996), US EPA 6010B(1996), ICP | 10 | N.D. |
| Beryllium (Be) | mg/kg | With reference to EPA 3052(1996), US EPA 6010B(1996), ICP | 1 | N.D. |

Flame Retardants-PBBs/PBDEs

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

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Sample No. : AYGU18-09545.001
Sample Description : PF142 BAR
Item No./Part No. : N/A
Materials : Sn99.3%, Cu0.7%

Flame Retardants-PBBs/PBDEs

| Test Items | Unit | Test Method | MDL | Results |
|--------------------------|-------|---|-----|---------|
| Dibromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Tribromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Tetrabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Pentabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Hexabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Heptabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Octabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Nonabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs by GC-MS) | 5 | N.D. |
| Decabromodiphenyl ether | mg/kg | With reference to IEC 62321-6:2015 (Determination of PBBs and PBDEs 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, GC/MS | 50 | N.D. |
| Di-butyl phthalate (DBP) | mg/kg | With reference to IEC 62321-8:2017, GC/MS | 50 | N.D. |
| Benzyl butyl phthalate (BBP) | mg/kg | With reference to IEC 62321-8:2017, GC/MS | 50 | N.D. |
| Di-isobutyl phthalate (DIBP) | mg/kg | With reference to IEC 62321-8:2017, GC/MS | 50 | N.D. |

Halogen Contents

| Test Items | Unit | Test Method | MDL | Results |
|--------------|-------|--------------------|-----|---------|
| Bromine(Br) | mg/kg | EN 14582:2016 , IC | 30 | N.D. |
| Chlorine(Cl) | mg/kg | EN 14582:2016 , IC | 30 | N.D. |

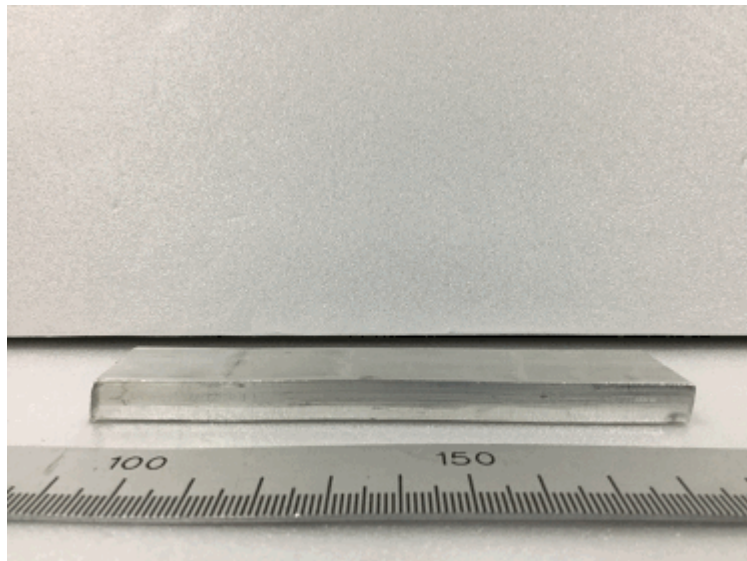
Flame Retardants

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

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- NOTE:
- (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 ug/cm². The sample coating is considered to contain CrVI.
 b. The sample is negative for CrVI if CrVI is n.d. (concentration less than 0.10 ug/cm²). The coating is considered a non-CrVI 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.

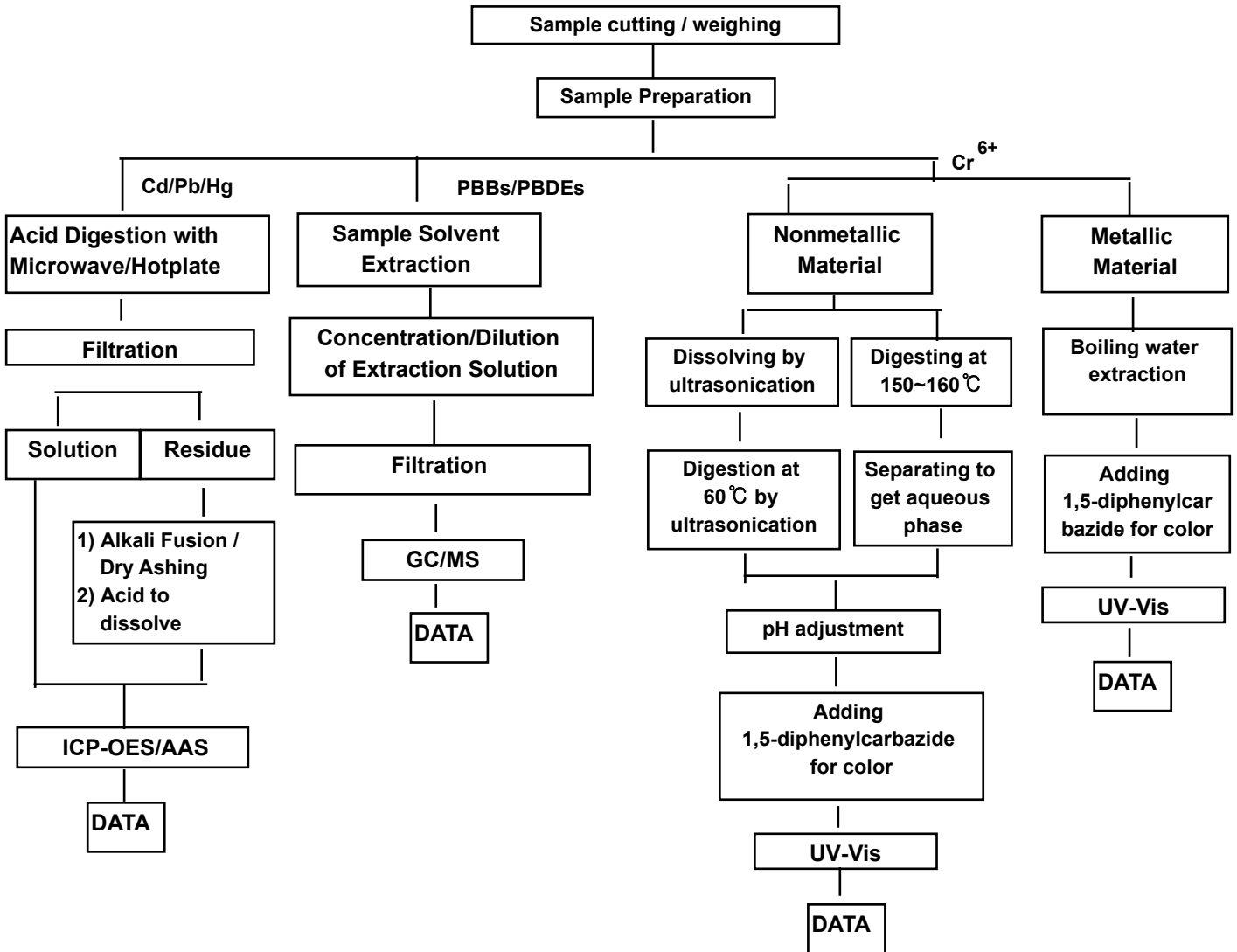
Picture of Sample as Received:



AYGU18-09545.001

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

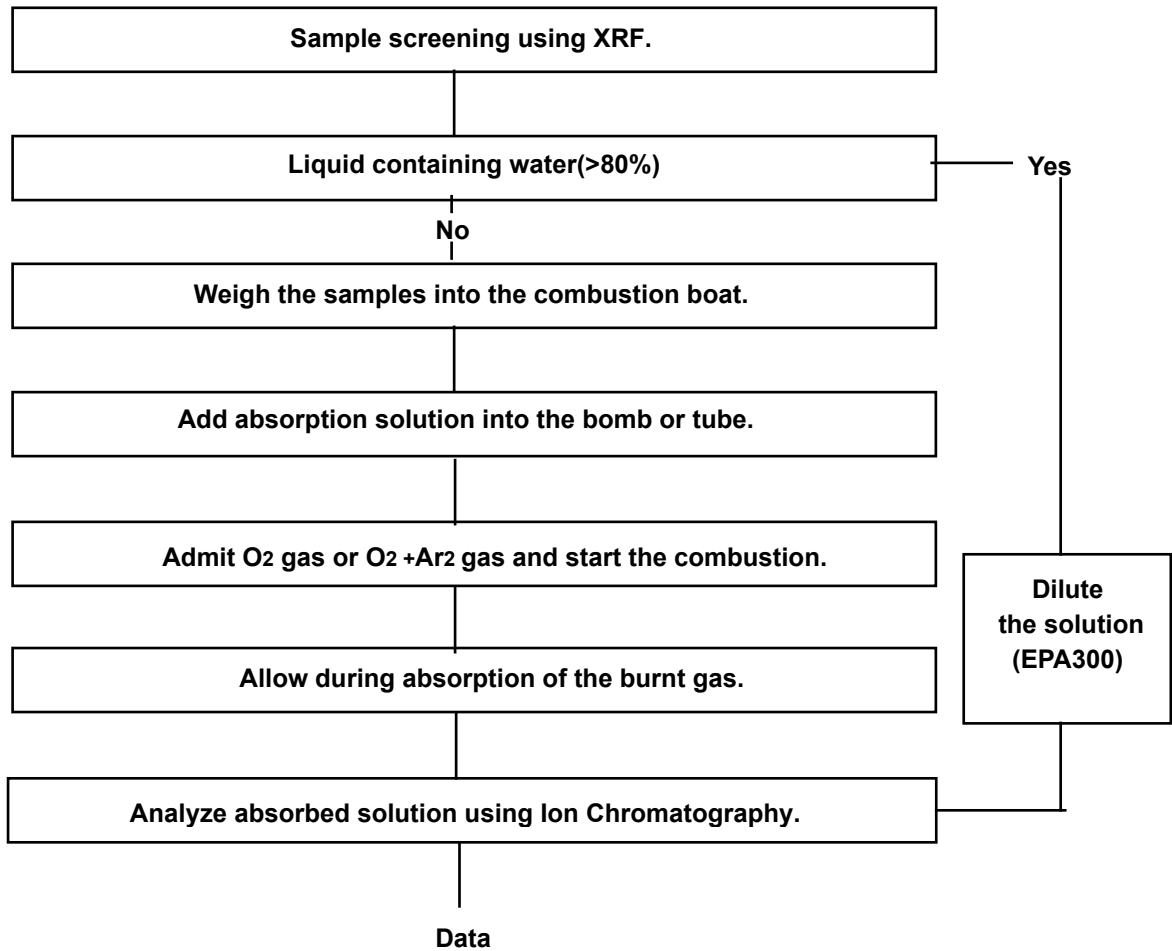


The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg
Section Chief : Sharpless Park

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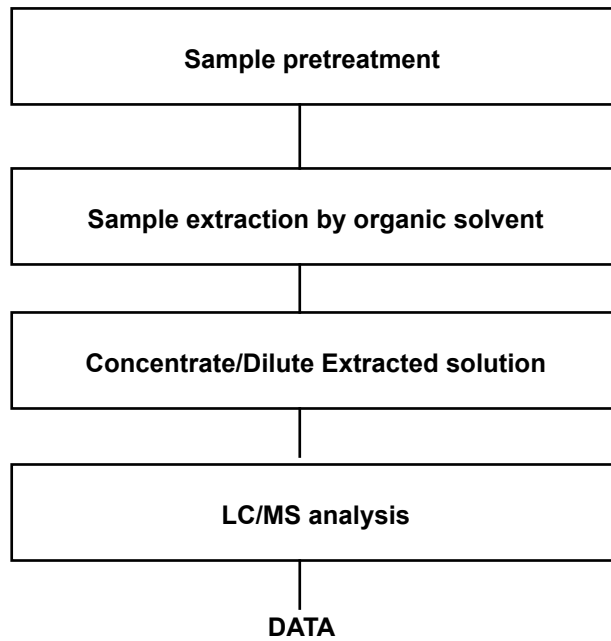
Flow Chart for Halogen Test



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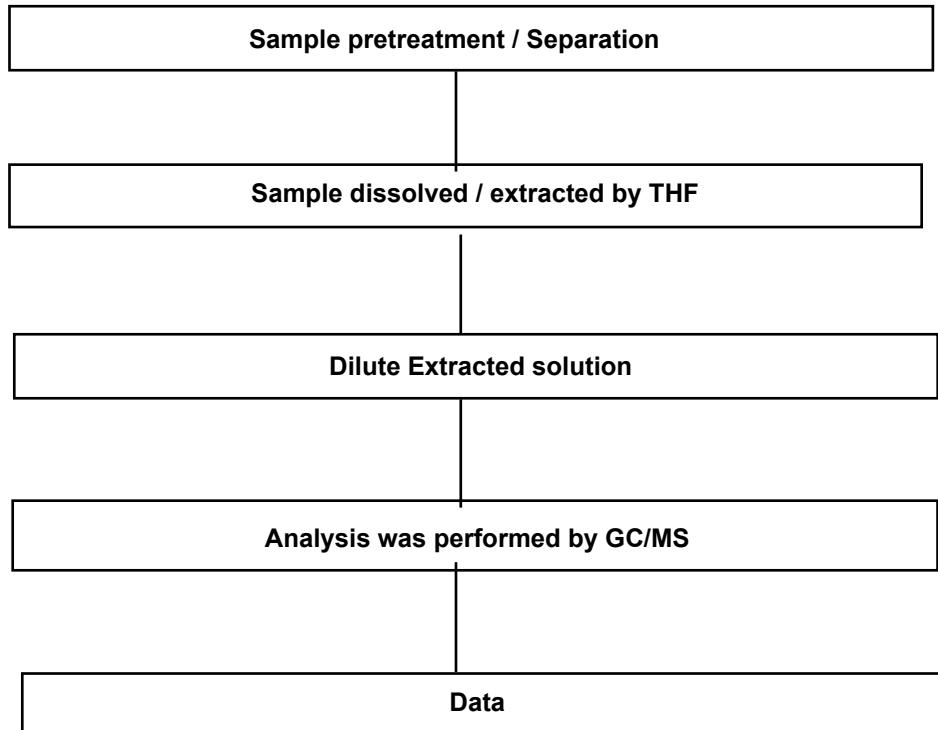
Testing Flow Chart for HBCD



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Flow Chart for Phthalate Test



*** End of Report ***

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