

SAMWHA ELECTRONICS CO., LTD.
215 Gyeonggidong-ro, Namsa-myeon
Cheoin-gu Yongin-si, Gyeonggi-do
Korea



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

SGS File No. : AYAA17-32975
Product Name : Mn-Zn High
Item No./Part No. : N/A
Received Date : 2017. 06. 15
Test Period : 2017. 06. 15 to 2017. 06. 20
Test Results : For further details, please refer to following page(s)

SGS Korea Co., Ltd.



Jeff Jang / Chemical Lab Mgr

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Test Report No. F690101/LF-CTSAYAA17-32975

Issued Date : 2017. 06. 20

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Sample No. : AYAA17-32975.001
Sample Description : Mn-Zn High
Item No./Part No. : N/A
Materials : N/A

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 | N.D. |
| Mercury (Hg) | mg/kg | With reference to IEC 62321-4:2013 (Determination of Mercury by ICP-OES) | 2 | N.D. |
| Hexavalent Chromium (Cr VI) | mg/kg | With reference to IEC 62321:2008 (Determination of Hexavalent Chromium by spot test/Colorimetric Method using UV-Vis) | 1 | N.D. |
| Beryllium (Be) | mg/kg | With reference to EPA 3052(1996), US EPA 6010B(1996), ICP | 5 | N.D. |
| Antimony (Sb) | mg/kg | With reference to EPA 3052(1996), US EPA 6010B(1996), ICP | 10 | N.D. |

Phthalates

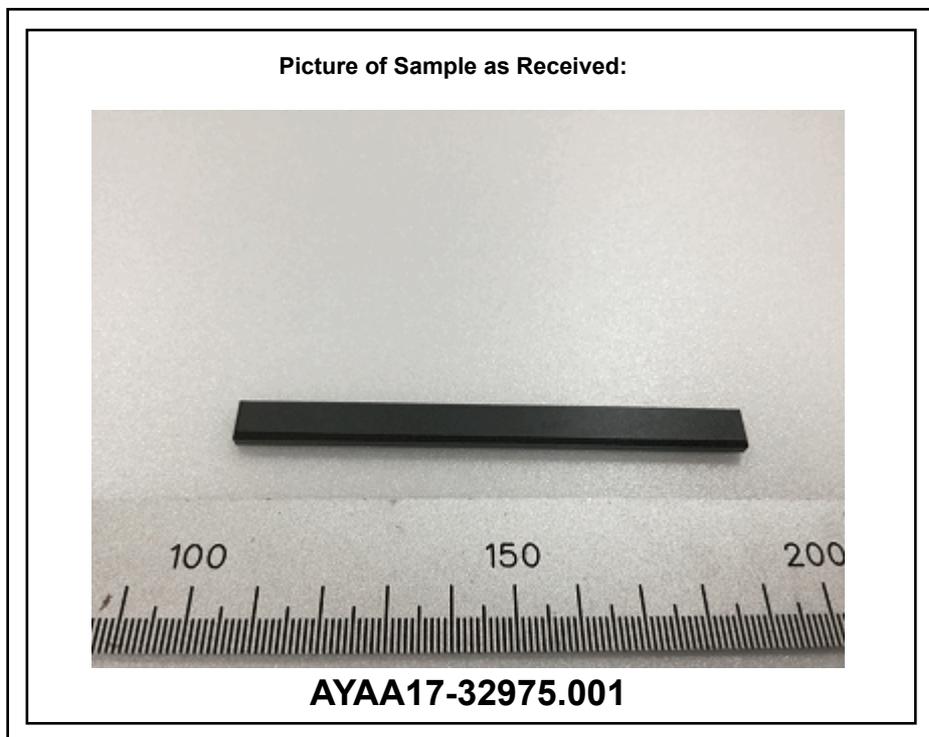
| Test Items | Unit | Test Method | MDL | Results |
|------------------------------------|-------|--|-----|---------|
| Di-(2-ethylhexyl) phthalate (DEHP) | mg/kg | With reference to IEC 62321-8 ; 2017 , GC/MS | 50 | N.D. |
| Di-butyl phthalate (DBP) | mg/kg | With reference to IEC 62321-8 ; 2017 , GC/MS | 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 Content

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

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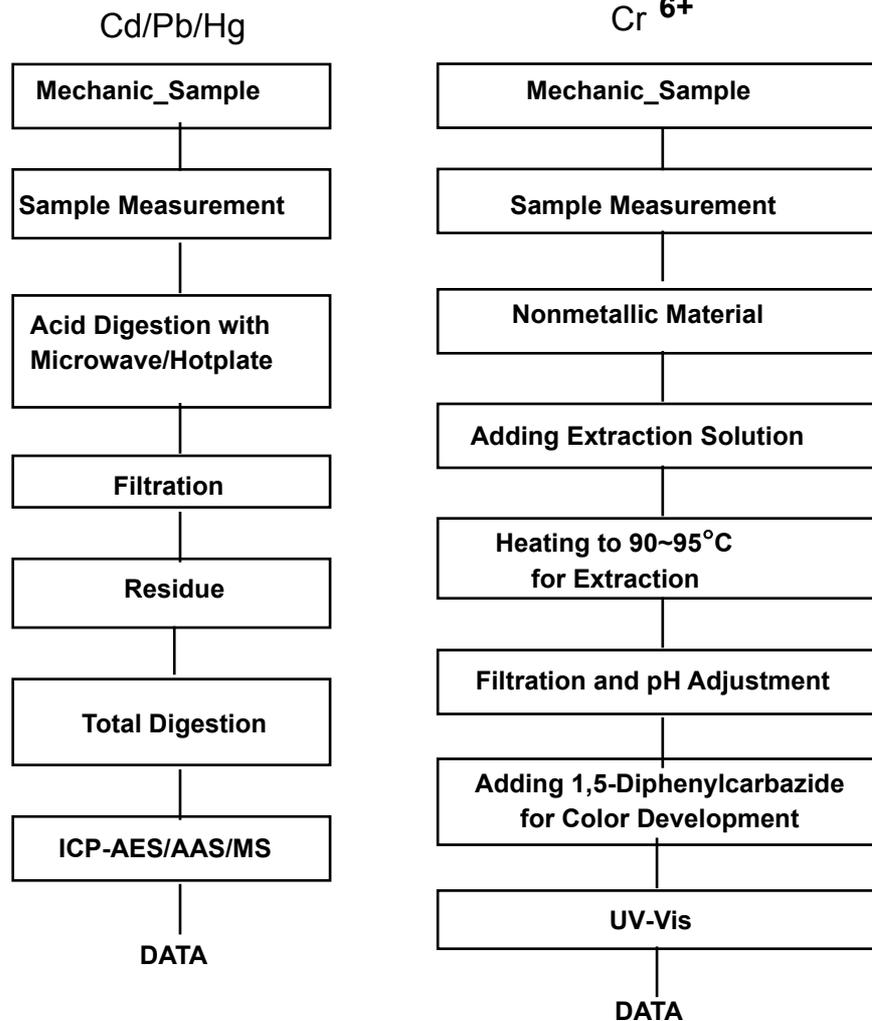
- NOTE:
- (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) Negative = Undetectable / Positive = Detectable
 - (6) ** = Qualitative analysis (No Unit)
 - (7) * = a. The sample is positive for CrVI if the CrVI concentration is greater 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.



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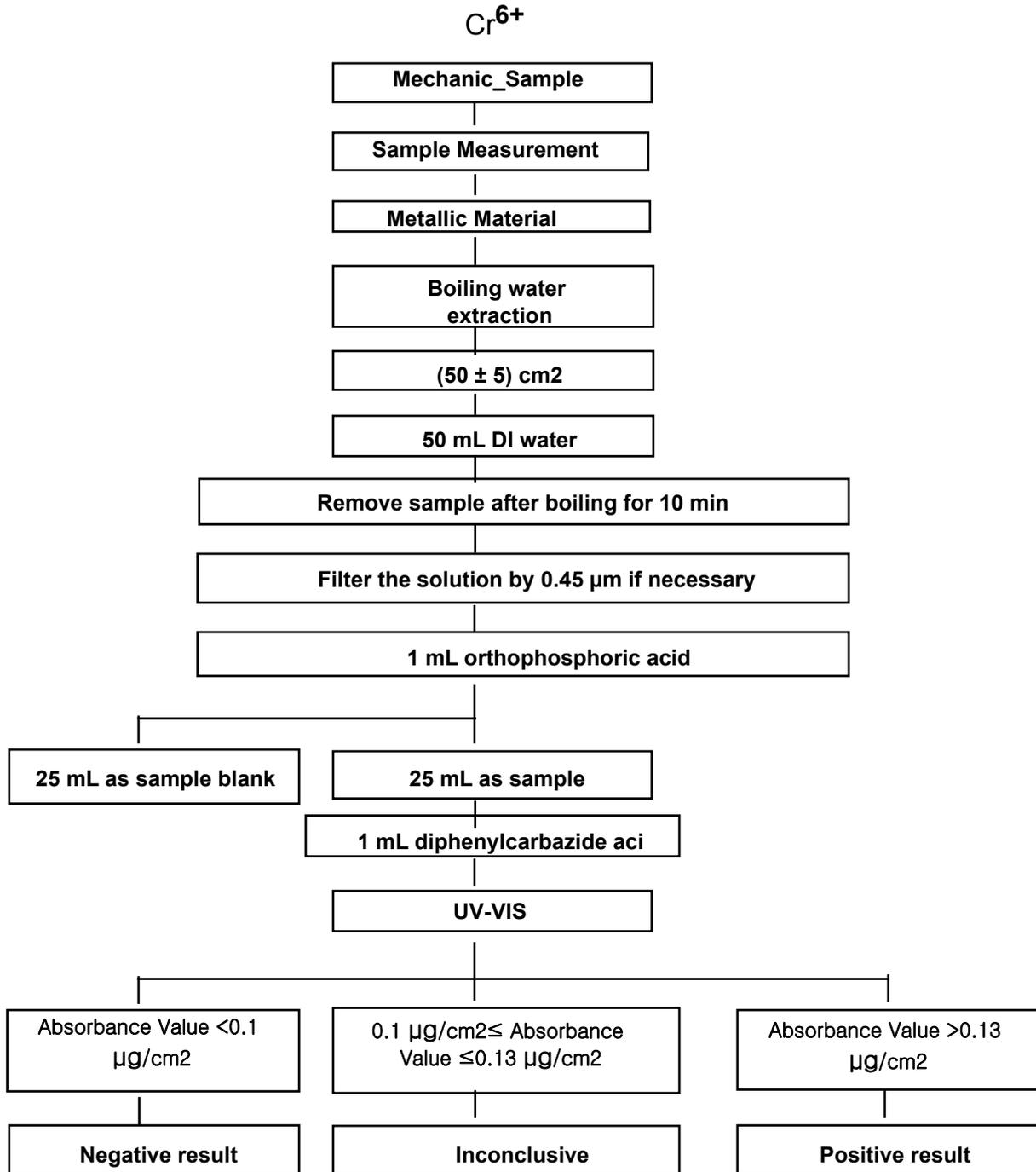


Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr⁶⁺ Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.
Section Chief : Gilsae Yi

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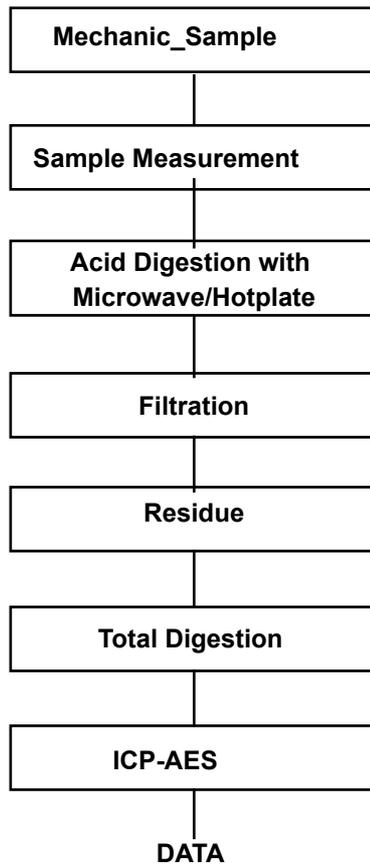


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Flow Chart for Inorganic Elements Testing

Inorganic Elements

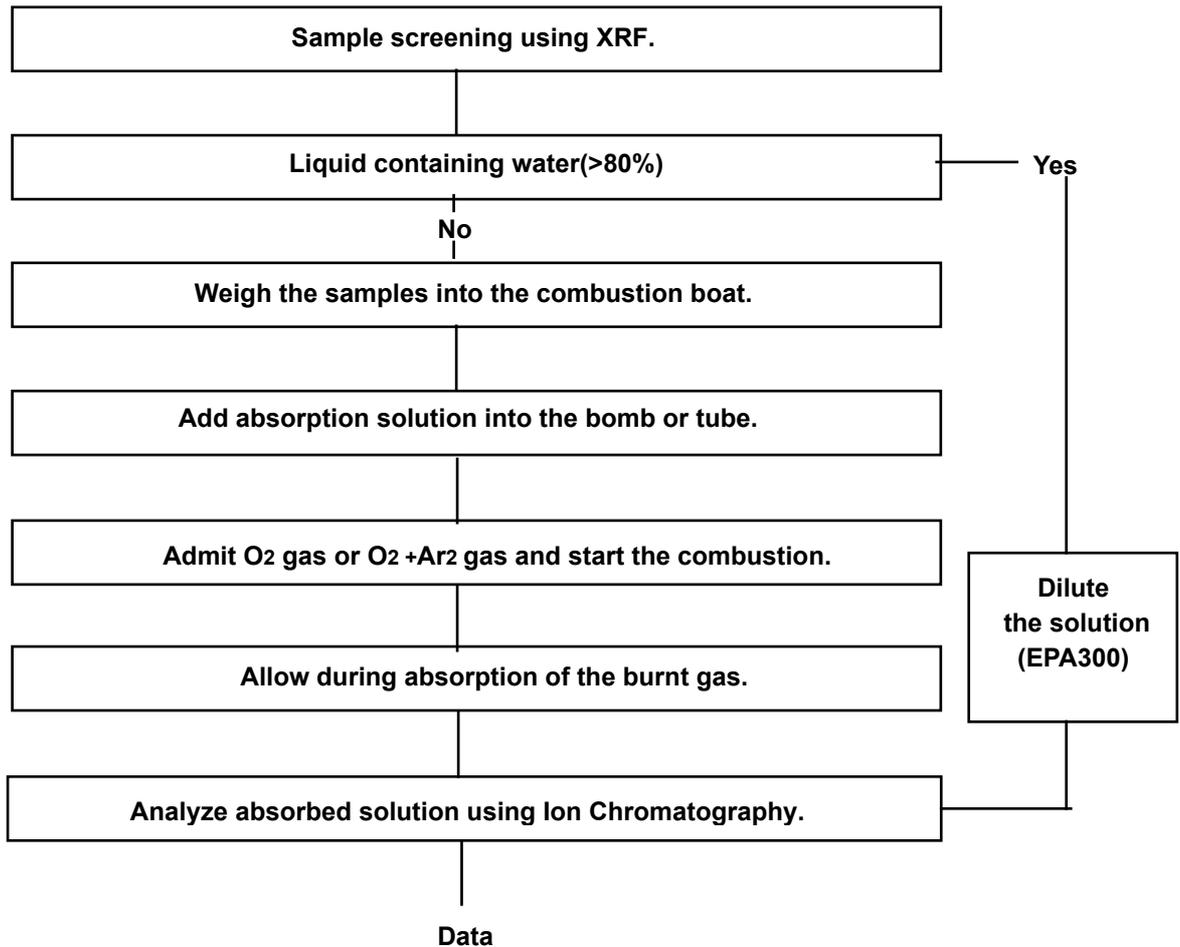


| | |
|------------------------------|---|
| Major Inorganic Heavy Metals | Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc. |
|------------------------------|---|

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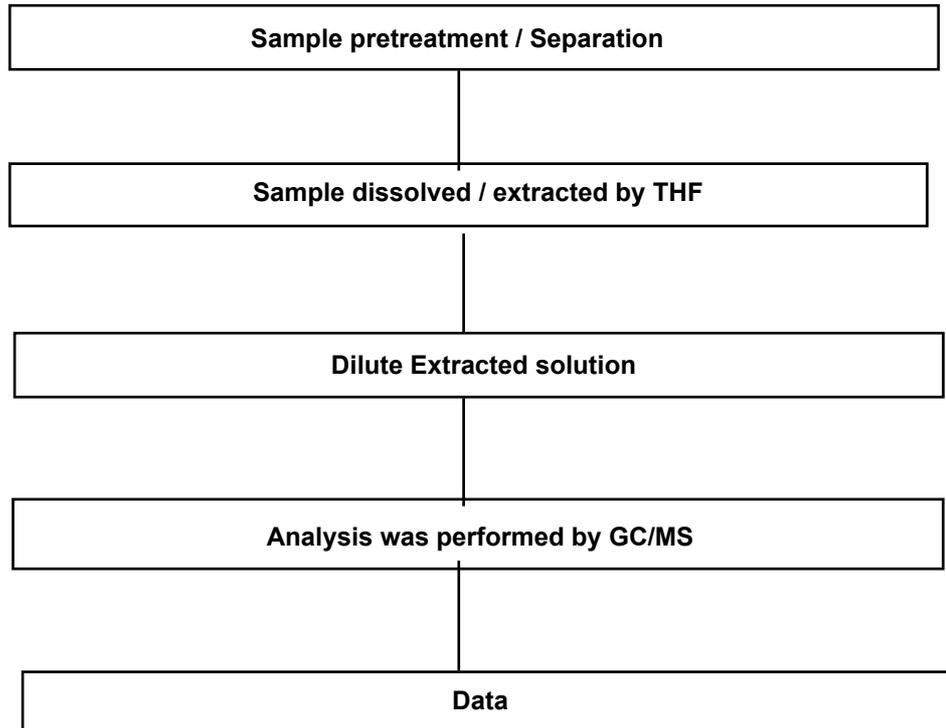
Flow Chart for Halogen Test



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Flow Chart for Phthalate Test



*** End of Report ***

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