



# Test Report No. F690101/LF-CTSAYGA23-00618

Issued Date : 2023. 01. 19

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## DHSTEEL

13, Sanmakgongdanbuk 4-gil  
Yangsan-si, Gyeongnam  
Korea



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

**SGS File No.** : AYGA23-00618  
**Product Name** : SWCH10A  
**Item No./Part No.** : N/A  
**Received Date** : 2023. 01. 05  
**Test Period** : 2023. 01. 05 to 2023. 01. 19  
**Test Results** : For further details, please refer to following page(s)

SGS Korea Co., Ltd.

Tommy Oh / Chemical Lab Mgr

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CQP-7080E07 (01)

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Sample No. : AYGA23-00618.001  
Sample Description : SWCH10A  
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, 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+AMD1:2017CVS, by ICP-OES | 2   | N.D.    |
| Hexavalent Chromium (Cr VI)* | µg/cm <sup>2</sup> | 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.    |

## 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.    |
| 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.    |

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Sample No. : AYGA23-00618.001  
Sample Description : SWCH10A  
Item No./Part No. : N/A  
Materials : N/A

## Flame Retardants-PBBs/PBDEs

| Test Items               | Unit  | Test Method                                    | MDL | Results |
|--------------------------|-------|--|-----|---------|
| 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.    |

## Chlorinated Paraffin

| Test Items   | Unit  | Test Method                              | MDL | Results |
|--|-------|--|-----|---------|
| Alkanes, C14~17, Medium Chain<br>Chlorinated Paraffins(MCCP) | mg/kg | With reference to ISO 18219, by CI-GC-MS | 50  | N.D.    |

## Flame Retardants

| Test Items                     | Unit  | Test Method                              | MDL | Results |
|--------------------------------|-------|--|-----|---------|
| Hexabromocyclododecane (HBCDD) | mg/kg | With reference to USEPA 3540 C, by LC/MS | 5   | 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/cm<sup>2</sup>.  
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/cm<sup>2</sup>).  
The coating is considered a non-Cr VI based coating.  
c. The result between 0.10 ug/cm<sup>2</sup> and 0.13 ug/cm<sup>2</sup> 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:

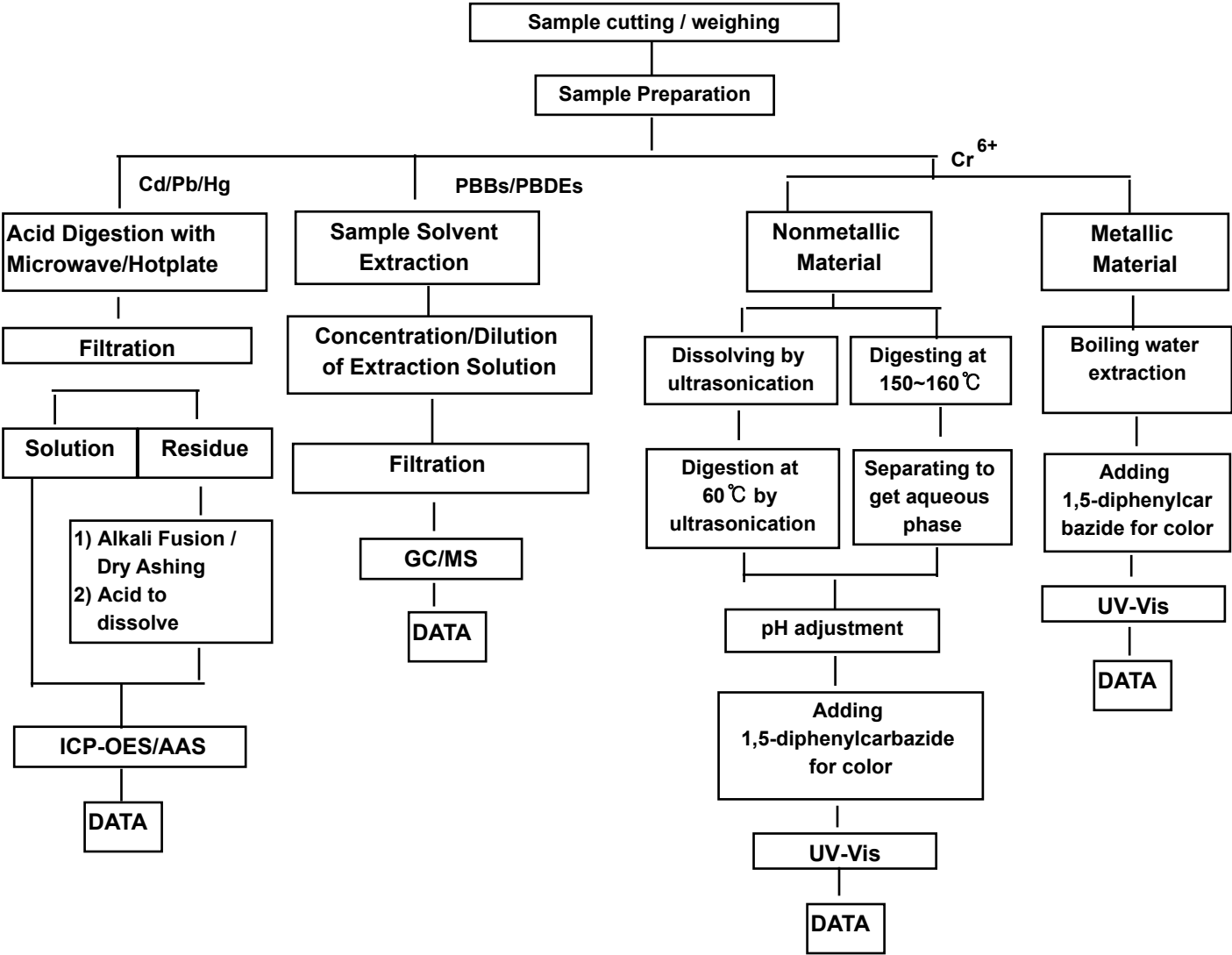


**AYGA23-00618.001**

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Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> /PBBs&PBDEs Testing

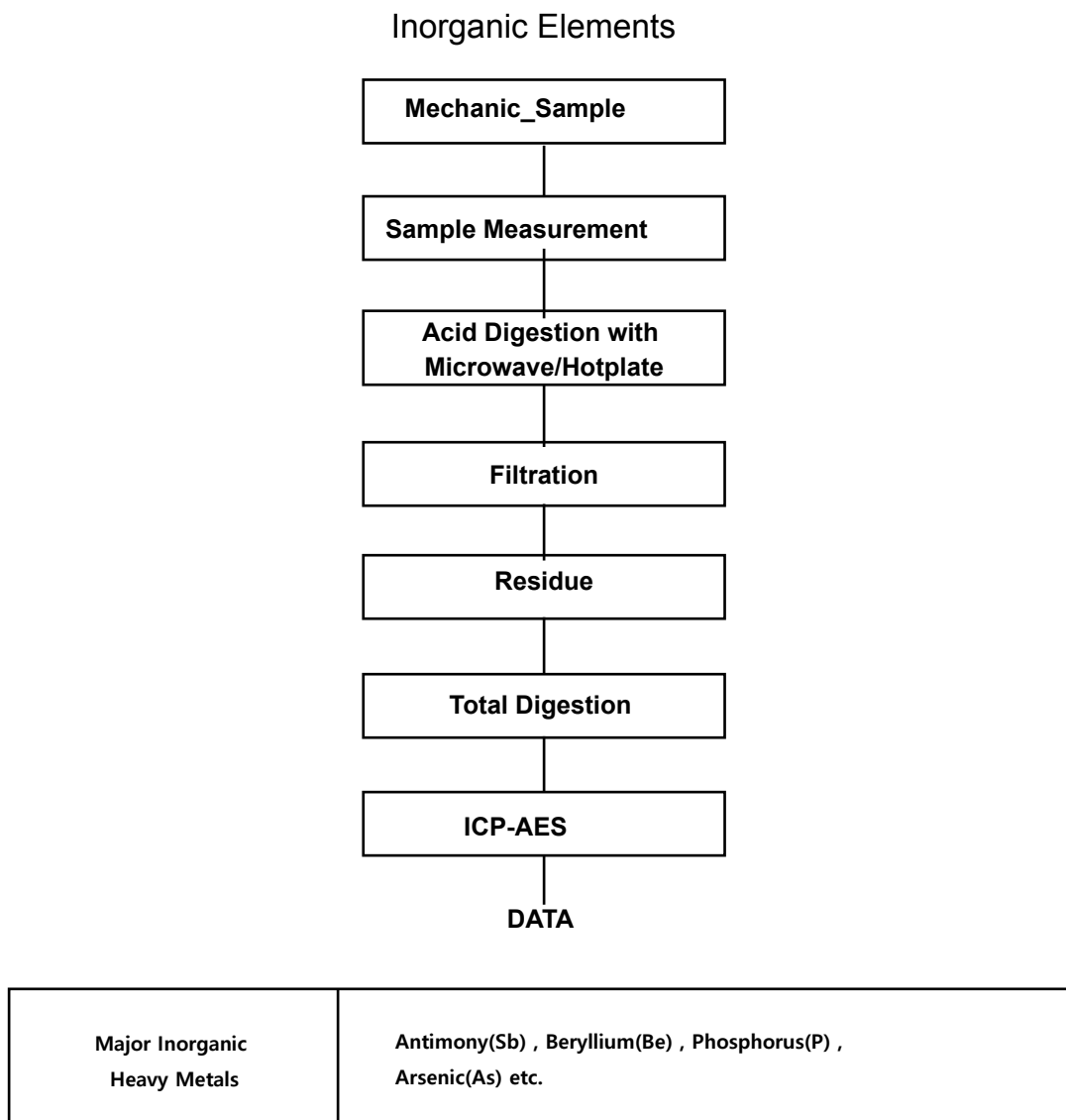


The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg  
Section Chief : Tonny Park

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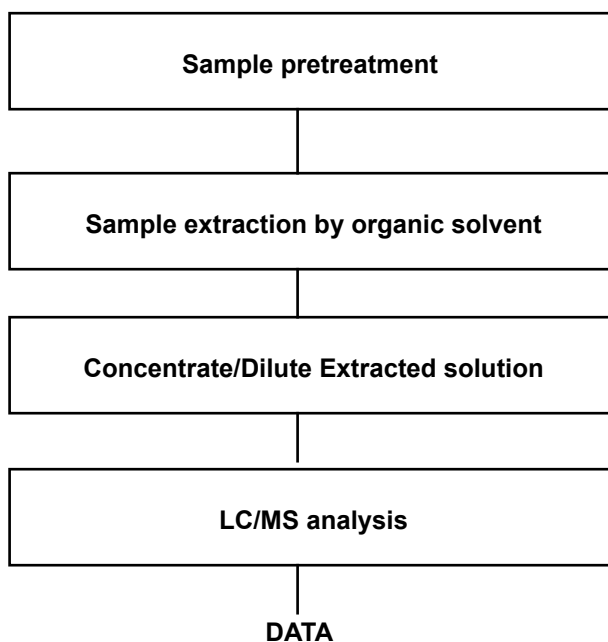
### Flow Chart for Inorganic Elements Testing



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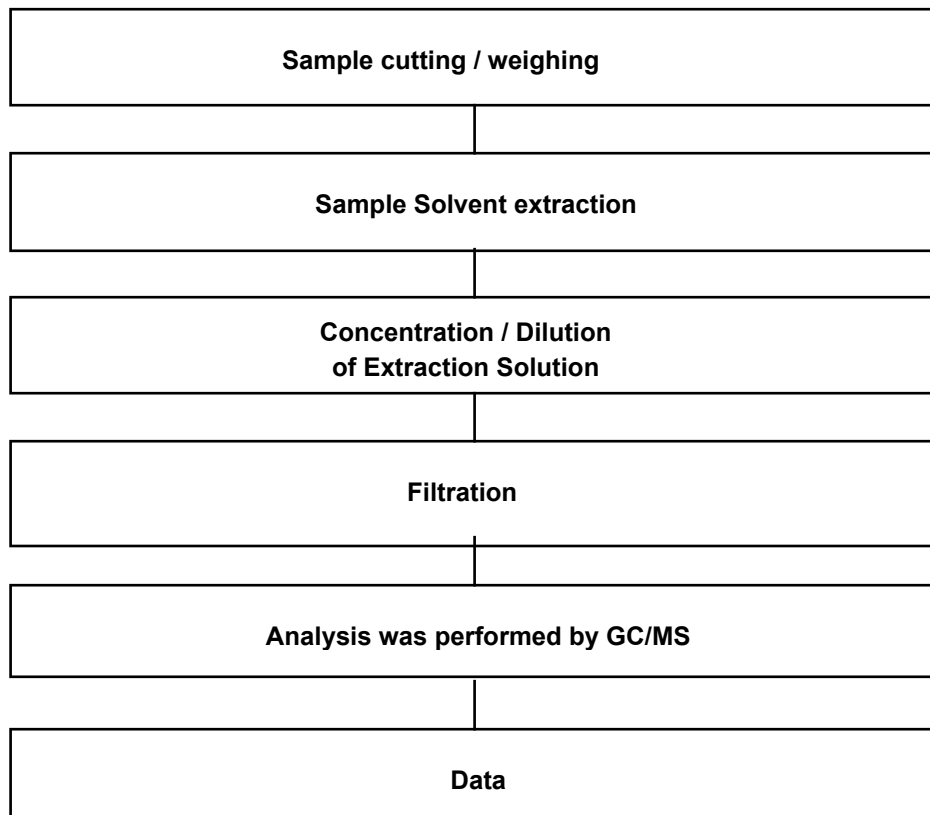
### Testing Flow Chart for HBCD



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### Flow Chart for Phthalate Test



\*\*\* End of Report \*\*\*

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