

**HYUNDAI SPECIAL STEEL**

151 Daesong-ro, Nam-gu  
Pohang-si, Gyeongbuk  
Korea



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

**SGS File No.** : AYGU24-00187  
**Product Name** : SUM43  
**Item No./Part No.** : N/A  
**Received Date** : 2024. 01. 02  
**Test Period** : 2024. 01. 02 to 2024. 01. 10  
**Test Results** : For further details, please refer to following page(s)

**SGS Korea Co., Ltd.**  
**/ Busan Branch**



**Taehee Kang / Technical Manager**

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Sample No. : AYGU24-00187.001  
 Sample Description : SUM43  
 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+A1 : 2017, 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.    |

**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.    |
| 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.    |

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Sample No. : AYGU24-00187.001  
 Sample Description : SUM43  
 Item No./Part No. : N/A  
 Materials : N/A

**Phthalates**

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

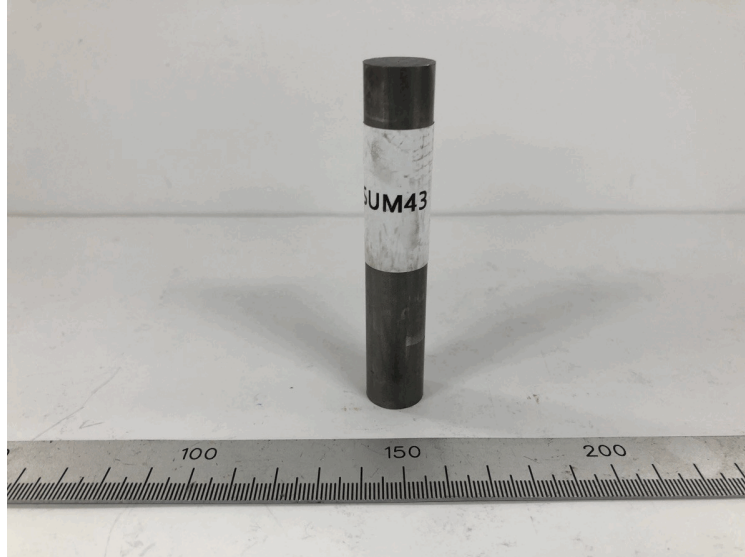
**Flame Retardants**

| Test Items                           | Unit  | Test Method   | MDL | Results |
|--------------------------------------|-------|---|-----|---------|
| Hexabromocyclododecane (HBCDD, HBCD) | mg/kg | With reference to EPA 3540C : 1996, EPA 3550C : 2007 by GC-MS | 5   | N.D.    |

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) µg/kg = ppb
  - (4) MDL = Method Detection Limit
  - (5) - = No regulation
  - (6) Negative = Undetectable / Positive = Detectable
  - (7) \*\* = Qualitative analysis (No Unit)
  - (8) \* = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 ug/cm<sup>2</sup>. 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/cm<sup>2</sup>). The coating is considered a non-CrVI 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.

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**Picture of Sample as Received:**



**AYGU24-00187.001**

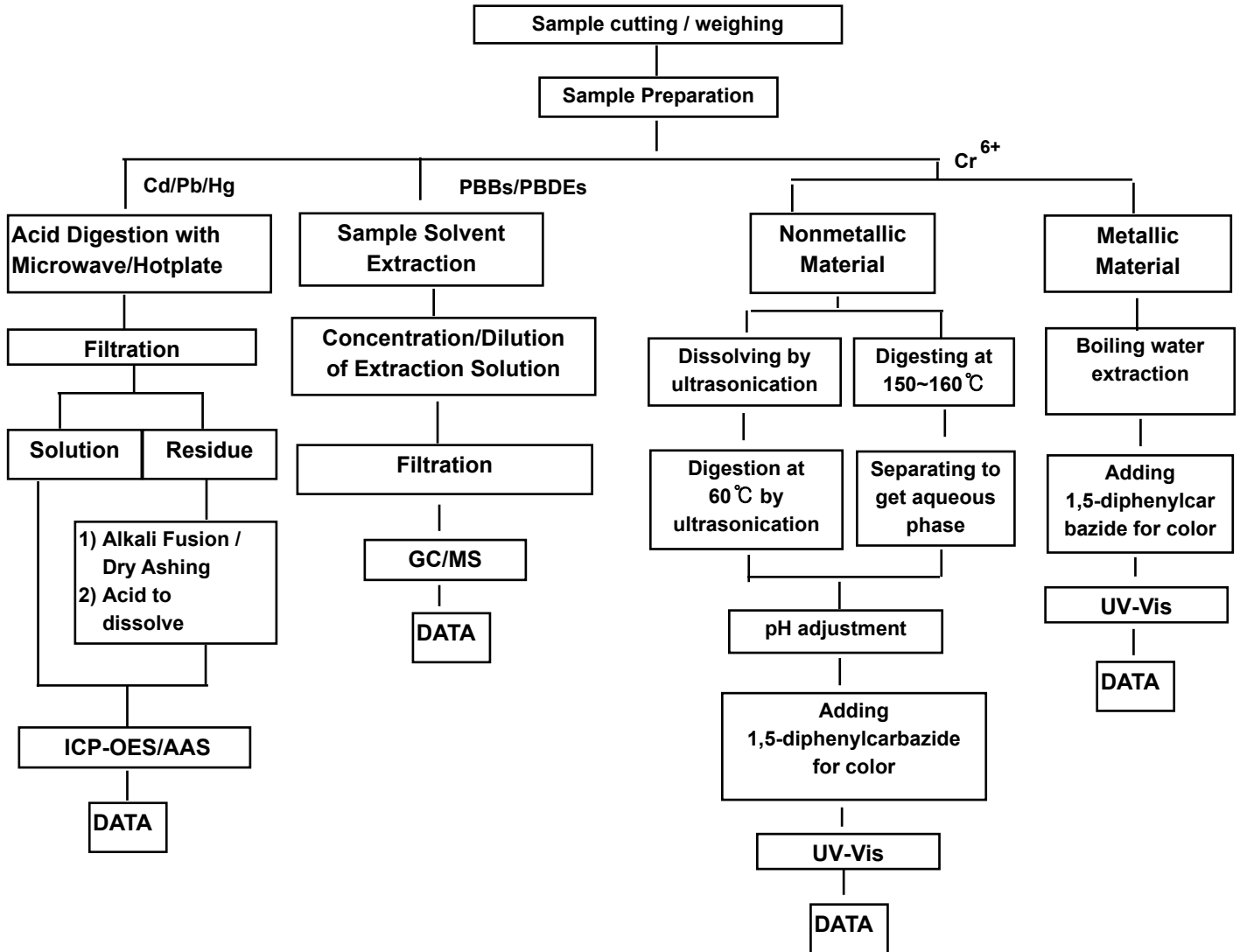
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MQP-708-001-F12 (01)

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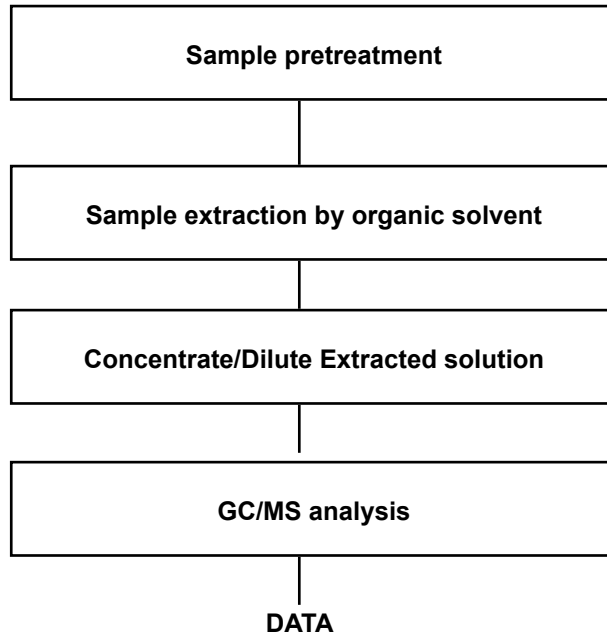
Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> /PBBs&PBDEs Testing



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

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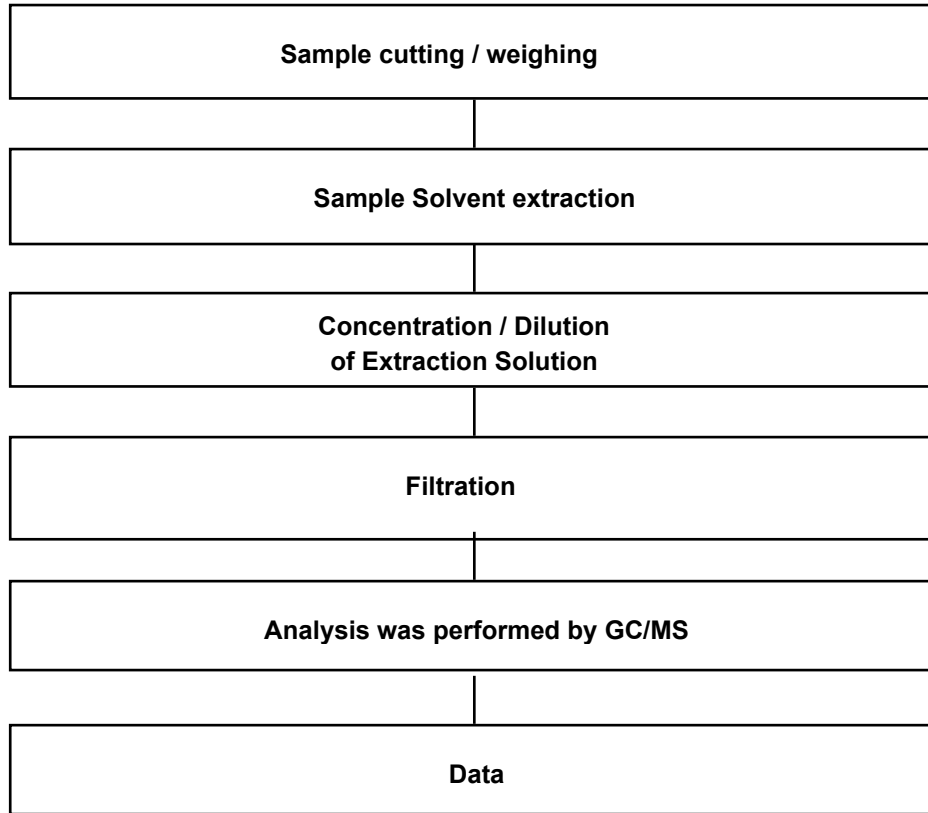
### Testing Flow Chart for HBCD



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### Flow Chart for Phthalate Test



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

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