# Test Report No. F690101/LF-CTSAYAA22-49090

Issued Date : 2023. 01. 03



**LX MMA CORP.**
58, Yeosusandan 4-ro
Yeosu-si, Jeollanam-do
Korea

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

| | | |
|---|---|---|
| **SGS File No.** | : | AYAA22-49090 |
| **Product Name** | : | Heat-resistant PMMA |
| **Item No./Part No.** | : | N/A |
| **Client Reference Data** | : | IH830HR, IH830HT, IH830XT |
| **Received Date** | : | 2022. 12. 27 |
| **Test Period** | : | 2022. 12. 27 to 2023. 01. 03 |
| **Report Comments** | : | By the applicant's request, item No.s/part No.s & client reference information are stated/added on report. |
| **Test Results** | : | For further details, please refer to following page(s) |

**SGS Korea Co., Ltd.**

**Tommy Oh / Chemical Lab Mgr**





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**Sample No.** : AYAA22-49090.001
**Sample Description** : Heat-resistant PMMA
**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)* | mg/kg | With reference to IEC 62321-7-2 : 2017, by UV-Vis and/or with reference to IEC 62321-5 : 2013, by ICP-OES | 8 | 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. |





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**Sample No.** : AYAA22-49090.001
**Sample Description** : Heat-resistant PMMA
**Item No./Part No.** : N/A
**Materials** : N/A

## Flame Retardants-PBBs/PBDEs

| Test Items | Unit | Test Method | MDL | Results |
|---|---|---|---|---|
| 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. |
| Di-isodecyl phthalate (DIDP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-isononyl phthalate (DINP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-n-octyl phthalate (DNOP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| [di(C7-C11 alkyl)phthalate] linear and branched (DHNUP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| [di(C6-C8 alkyl)phthalate] branched (DIHP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-methyl phthalate (DMP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-ethyl phthalate(DEP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-iso-pentyl phthalate(DIPP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| n-Pentyl-isopentyl phthalate (iPnPP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-n-pentyl phthalate(DPP, DnPP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |
| Di-n-hexyl phthalate (DNHP) | mg/kg | With reference to IEC 62321-8 : 2017, by GC-MS | 50 | N.D. |

## Halogen Contents

| Test Items | Unit | Test Method | MDL | Results |
|---|---|---|---|---|
| Bromine(Br) | mg/kg | With reference to IEC 62321-3-2 : 2020, by C-IC | 30 | N.D. |
| Chlorine(Cl) | mg/kg | With reference to IEC 62321-3-2 : 2020, by C-IC | 30 | N.D. |





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**Sample No.** : AYAA22-49090.001
**Sample Description** : Heat-resistant PMMA
**Item No./Part No.** : N/A
**Materials** : N/A

## 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. |

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 result of Hexavalent Chromium (Cr(VI)) is “ND” as the result of Chromium (Cr) is “ND”, and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
b. If the content of Total Chromium (Cr) is greater than the MDL of Hexavalent Chromium (Cr(VI)), it is the result of hexavalent Chromium by UV-VIS.
(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.





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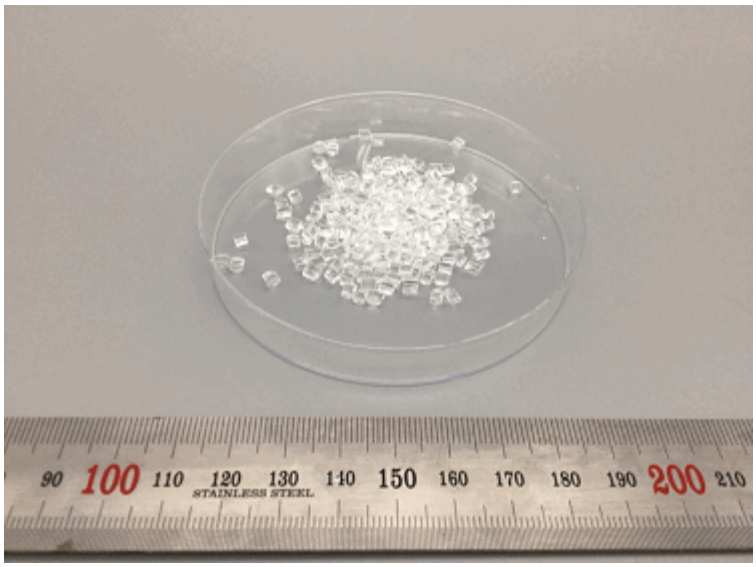
**Picture of Sample as Received:**




**AYAA22-49090.001**





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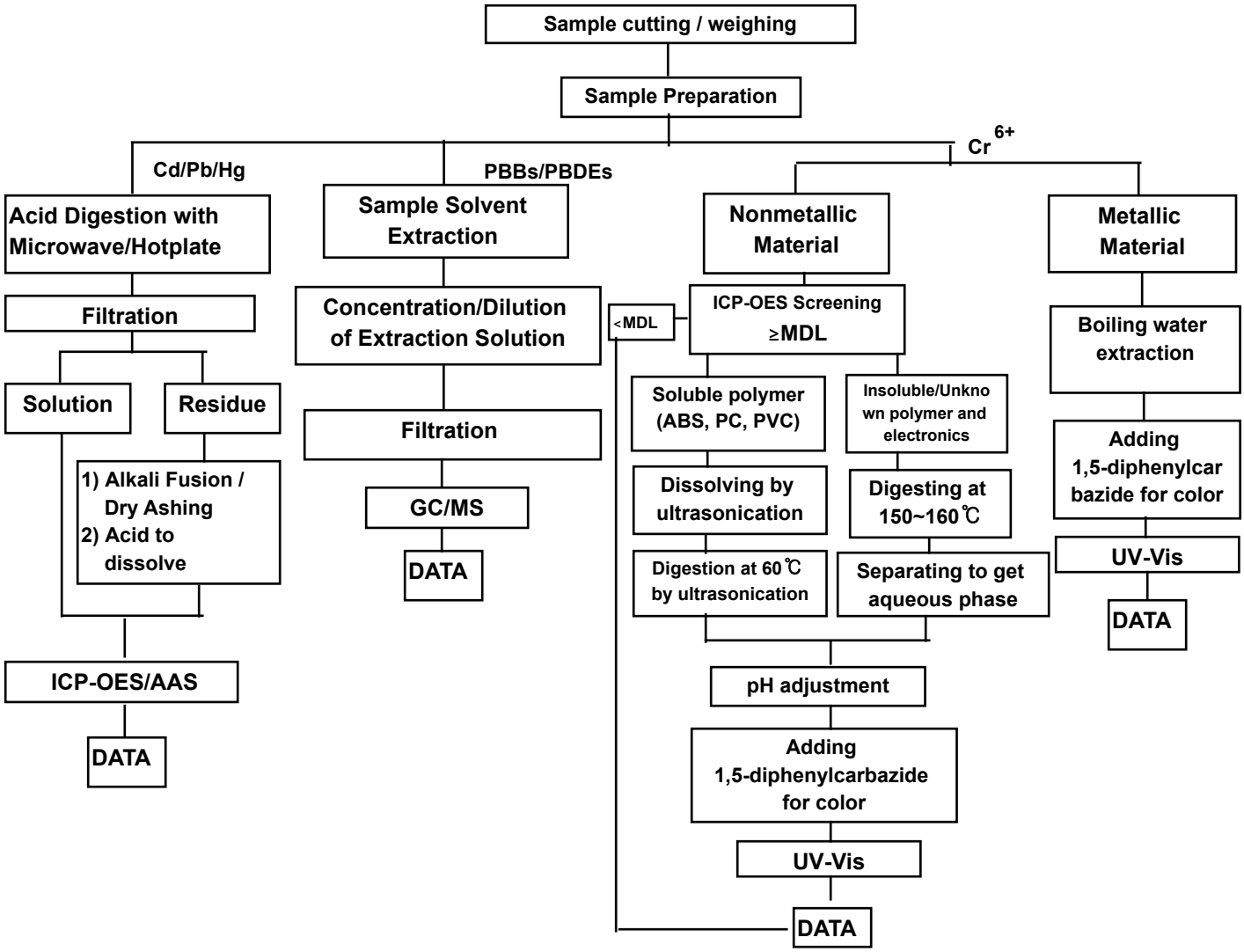
## Testing Flow Chart for RoHS:Cd/Pb/Hg/$Cr^{6+}$ /PBBs&PBDEs Testing




**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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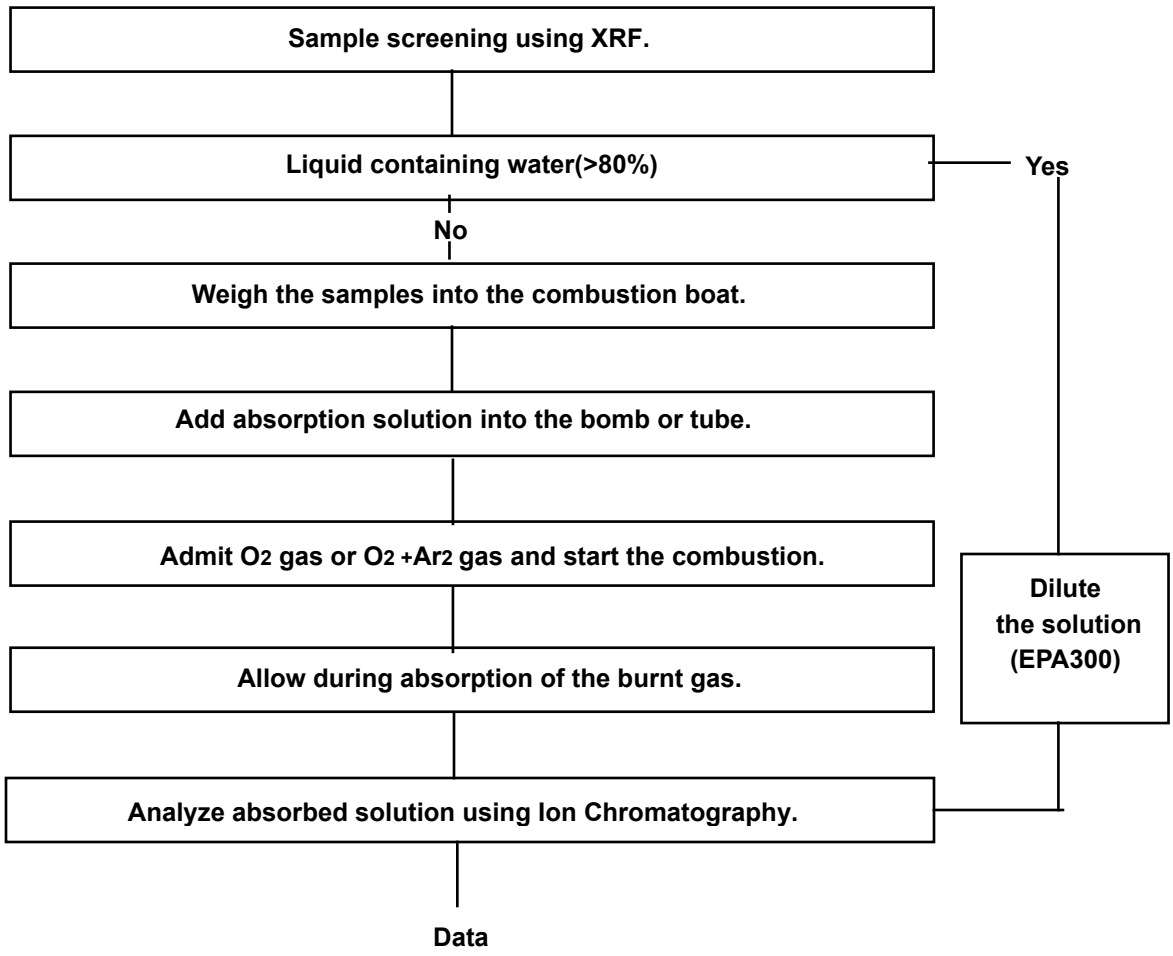
## Flow Chart for Halogen Test





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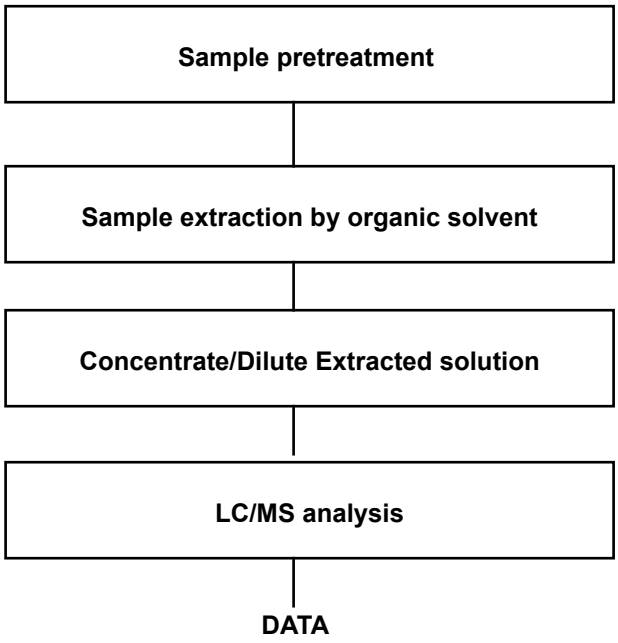
## Testing Flow Chart for HBCD





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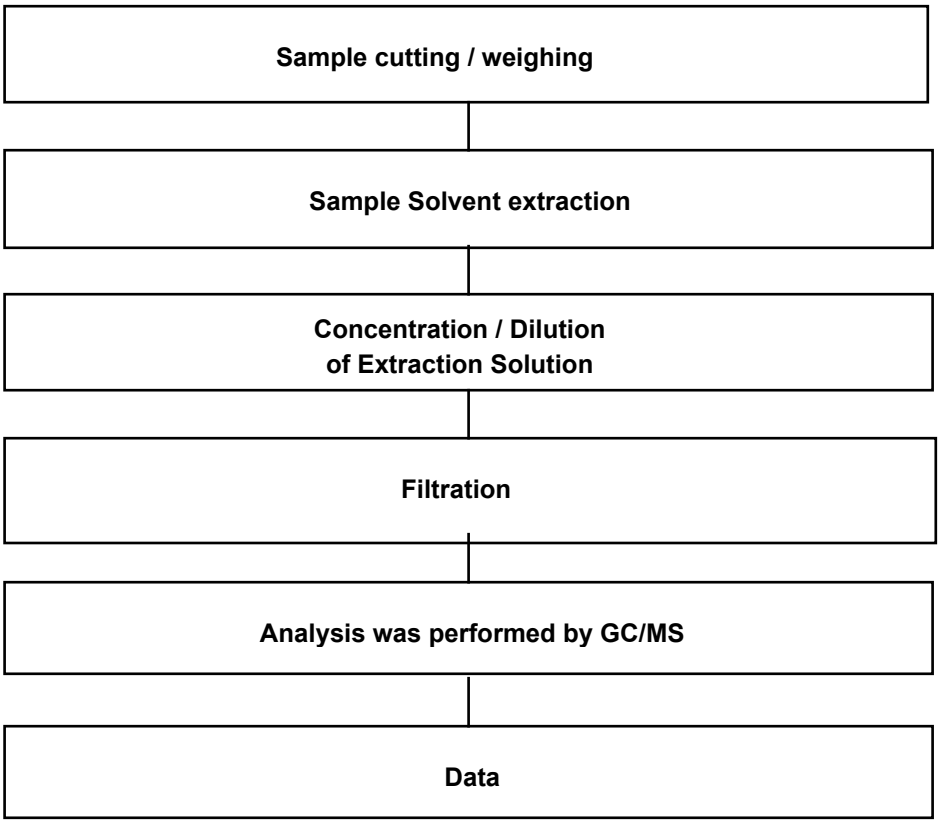
## Flow Chart for PhthalateTest




*** End of Report ***





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