# Test Report

No. : CE/2016/83917 Date : 2016/08/25



MINMAX TECHNOLOGY CO., LTD
NO. 18, SIN-SIN ROAD, AN-PING INDUSTRIAL DISTRICT, TAINAN 702, TAIWAN

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

| | | |
|---|---|---|
| Sample Submitted By | : | MINMAX TECHNOLOGY CO., LTD |
| Sample Description | : | DC-DC CONVERTER |
| Style/Item No. | : | MKE15-XXXXXHI SERIES |
| Sample Receiving Date | : | 2016/08/19 |
| Testing Period | : | 2016/08/19 TO 2016/08/25 |

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**Test Requested** : As specified by client, to test Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample.

**Test Result(s)** : Please refer to next page(s).

SGS TAIWAN LTD

Troy Chang / Manager - Tech
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

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**Test Result(s)**

PART NAME No.1 : MIXED ALL PARTS

| Test Item(s) | Unit | Method | MDL | Result |
|---|---|---|---|---|
| | | | | No.1 |
| Cadmium (Cd) | mg/kg | With reference to IEC 62321-5 (2013) and performed by ICP-AES. | 2 | n.d. |
| Lead (Pb) | mg/kg | With reference to IEC 62321-5 (2013) and performed by ICP-AES. | 2 | 15.0 |
| Mercury (Hg) | mg/kg | With reference to IEC 62321-4 (2013) and performed by ICP-AES. | 2 | n.d. |
| Hexavalent Chromium Cr(VI) | mg/kg | With reference to IEC 62321 (2008) and performed by UV-VIS. | 2 | n.d. |
| **Sum of PBBs** | mg/kg | With reference to IEC 62321-6 (2015) and performed by GC/MS. | - | n.d. |
| Monobromobiphenyl | mg/kg | | 5 | n.d. |
| Dibromobiphenyl | mg/kg | | 5 | n.d. |
| Tribromobiphenyl | mg/kg | | 5 | n.d. |
| Tetrabromobiphenyl | mg/kg | | 5 | n.d. |
| Pentabromobiphenyl | mg/kg | | 5 | n.d. |
| Hexabromobiphenyl | mg/kg | | 5 | n.d. |
| Heptabromobiphenyl | mg/kg | | 5 | n.d. |
| Octabromobiphenyl | mg/kg | | 5 | n.d. |
| Nonabromobiphenyl | mg/kg | | 5 | n.d. |
| Decabromobiphenyl | mg/kg | | 5 | n.d. |
| **Sum of PBDEs** | mg/kg | | - | n.d. |
| Monobromodiphenyl ether | mg/kg | | 5 | n.d. |
| Dibromodiphenyl ether | mg/kg | | 5 | n.d. |
| Tribromodiphenyl ether | mg/kg | | 5 | n.d. |
| Tetrabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Pentabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Hexabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Heptabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Octabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Nonabromodiphenyl ether | mg/kg | | 5 | n.d. |
| Decabromodiphenyl ether | mg/kg | | 5 | n.d. |

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| Test Item(s) | Unit | Method | MDL | Result |
|---|---|---|---|---|
| | | | | No.1 |
| BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7) | mg/kg | With reference to IEC 62321-8/CD (2013). Analysis was performed by GC/MS. | 50 | n.d. |
| DBP (Dibutyl phthalate) (CAS No.: 84-74-2) | mg/kg | | 50 | n.d. |
| DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7) | mg/kg | | 50 | n.d. |
| DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5) | mg/kg | | 50 | n.d. |

**Note：**

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value.

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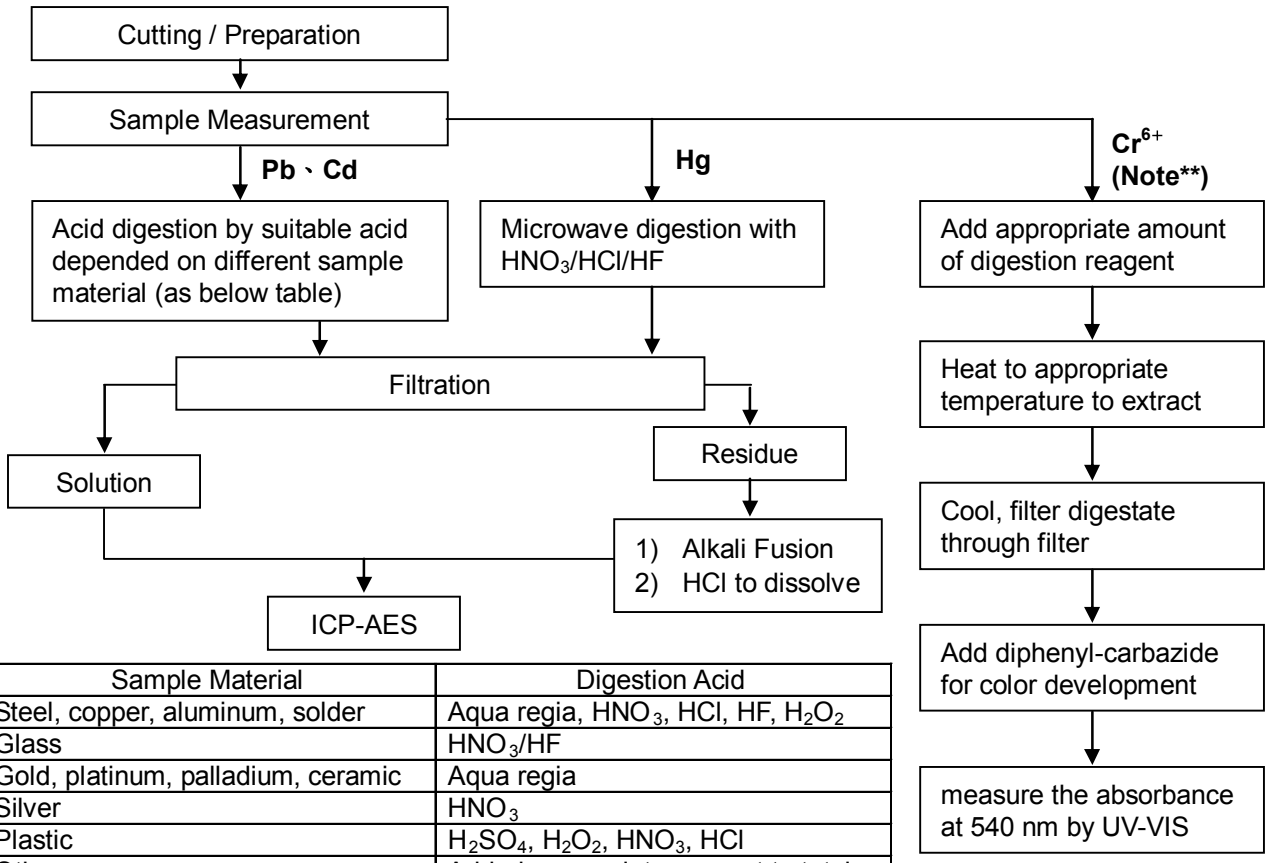
## Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.
（$Cr^{6+}$ test method excluded）

- Technician: JR Wang
- Supervisor: Troy Chang




| Sample Material | Digestion Acid |
|---|---|
| Steel, copper, aluminum, solder | Aqua regia, $HNO_3$, HCl, HF, $H_2O_2$ |
| Glass | $HNO_3$/HF |
| Gold, platinum, palladium, ceramic | Aqua regia |
| Silver | $HNO_3$ |
| Plastic | $H_2SO_4$, $H_2O_2$, $HNO_3$, HCl |
| Others | Added appropriate reagent to total digestion |

**Note** (For IEC 62321)**

(1) For non-metallic material, add alkaline digestion reagent and heat to 90~95℃.
(2) For metallic material, add pure water and heat to boiling.

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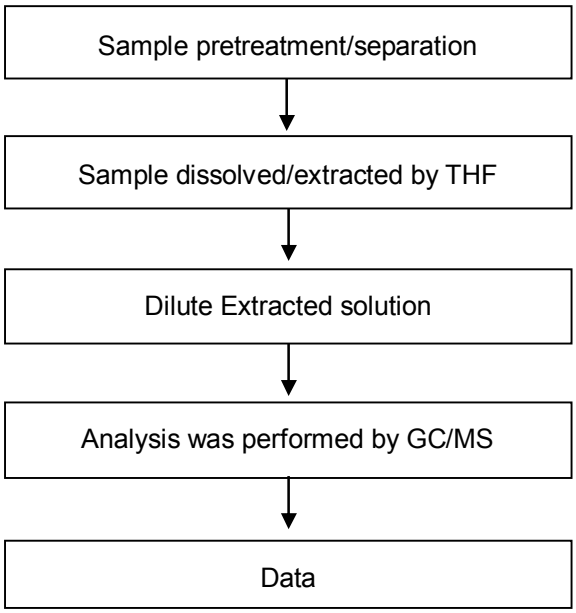
## Analytical flow chart - Phthalate

- Technician: Andy Shu
- Supervisor: Troy Chang

**【Test method: IEC 62321-8】**



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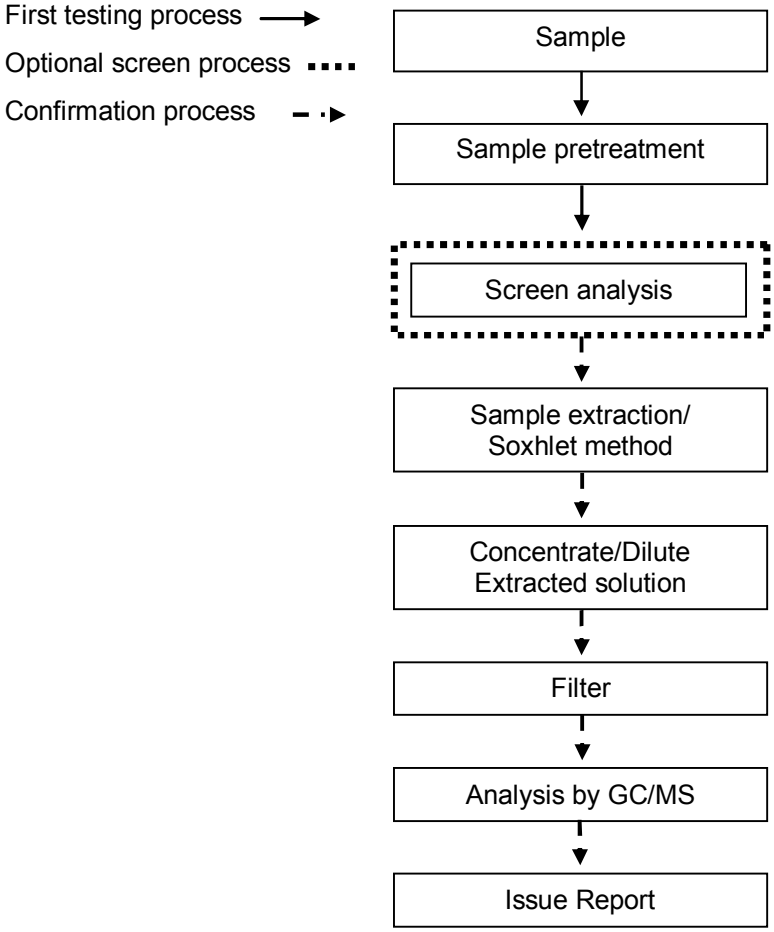
## Analytical flow chart - PBB/PBDE

- Technician : Yaling Tu
- Supervisor: Troy Chang



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*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

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** End of Report **