

## Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 1 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)



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

Sample Submitted By : AVX HONG KONG LTD. (TAIWAN BRANCH)  
Sample Description : LF NILO-Sn I.  
Style/Item No. : TANTALUM DIVISION  
Sample Receiving Date : 2018/03/20  
Testing Period : 2018/03/20 TO 2018/03/27

Test Requested : As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

Test Method : Please refer to following pages.

Test Result(s) : Please refer to following pages.

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



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# Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 2 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

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## Test Result(s)

PART NAME No.1 : PLATING LAYER OF SILVER COLORED METAL  
 PART NAME No.2 : BASE MATERIAL OF SILVER COLORED METAL  
 PART NAME No.3 : SILVER COLORED METAL (INCLUDING THE PLATING LAYER)

| Test Item(s)  | Unit   | Method  | MDL  | Result |      |      |
|---|--------|---|------|--------|------|------|
|   |        |   |      | No.1   | No.2 | No.3 |
| Cadmium (Cd)  | mg/kg  | IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES. | 2    | n.d.   | ---  | ---  |
|   | mg/kg  | With reference to IEC 62321-5 (2013) and performed by ICP-AES.                                    | 2    | ---    | n.d. | ---  |
| Lead (Pb)   | mg/kg  | IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES. | 2    | 51.8   | ---  | ---  |
|   | mg/kg  | With reference to IEC 62321-5 (2013) and performed by ICP-AES.                                    | 2    | ---    | n.d. | ---  |
| Mercury (Hg)  | mg/kg  | IEC 62321-4 (2013) application of modified digestion by surface etching and performed by ICP-AES. | 2    | n.d.   | ---  | ---  |
|   | mg/kg  | With reference to IEC 62321-4 (2013) and performed by ICP-AES.                                    | 2    | ---    | n.d. | ---  |
| Hexavalent Chromium Cr(VI)(#2)                          | µg/cm² | With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.                                   | 0.10 | n.d.   | n.d. | ---  |
| BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)         | mg/kg  | With reference to IEC 62321-8 (2017). 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. |

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# Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 3 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)



7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

| Test Item(s)             | Unit  | Method   | MDL | Result |      |      |
|--------------------------|-------|--|-----|--------|------|------|
|                          |       |  |     | No.1   | No.2 | No.3 |
| <b>Sum of PBBs</b>       | 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. | ---  |
| <b>Sum of PBDEs</b>      | 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. | ---  |

## Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. " --- " = Not Conducted
6. (#2) =
  - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/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 n.d. (concentration less than 0.10 µg/cm<sup>2</sup>).  
The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive - unavoidable coating variations may influence the determination.

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# Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 4 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

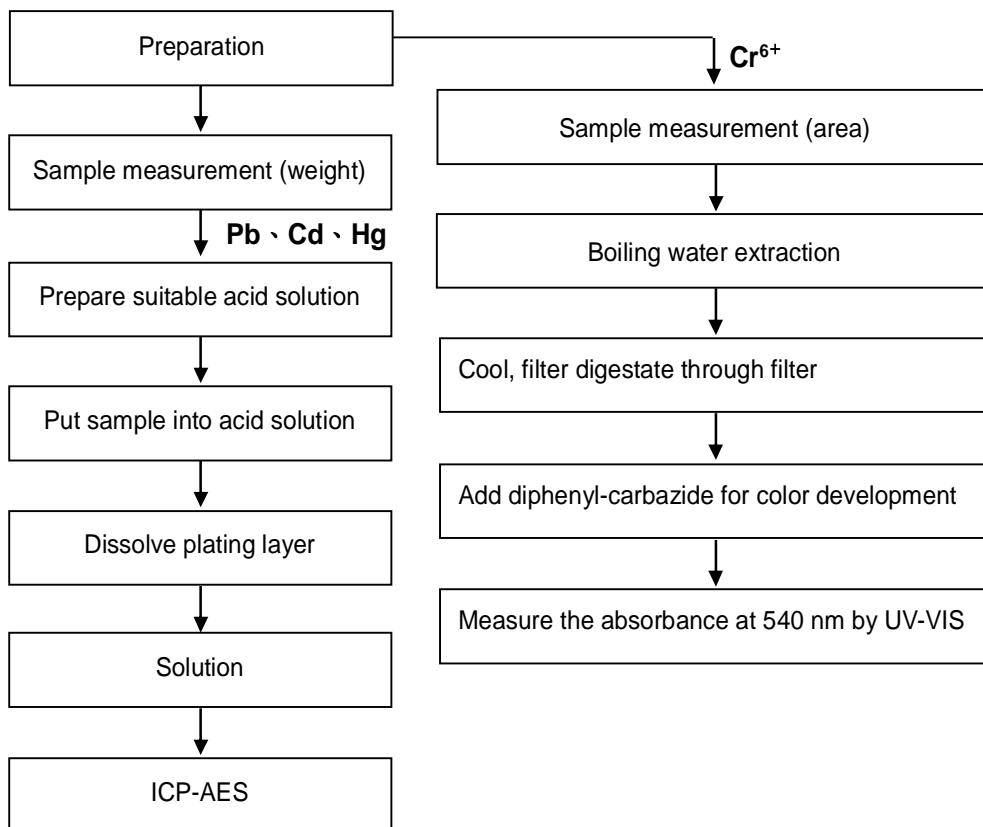


No.1

The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)

- Technician: JR Wang
- Supervisor: Troy Chang

## Flow Chart of Stripping method for metal analysis



## Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 5 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

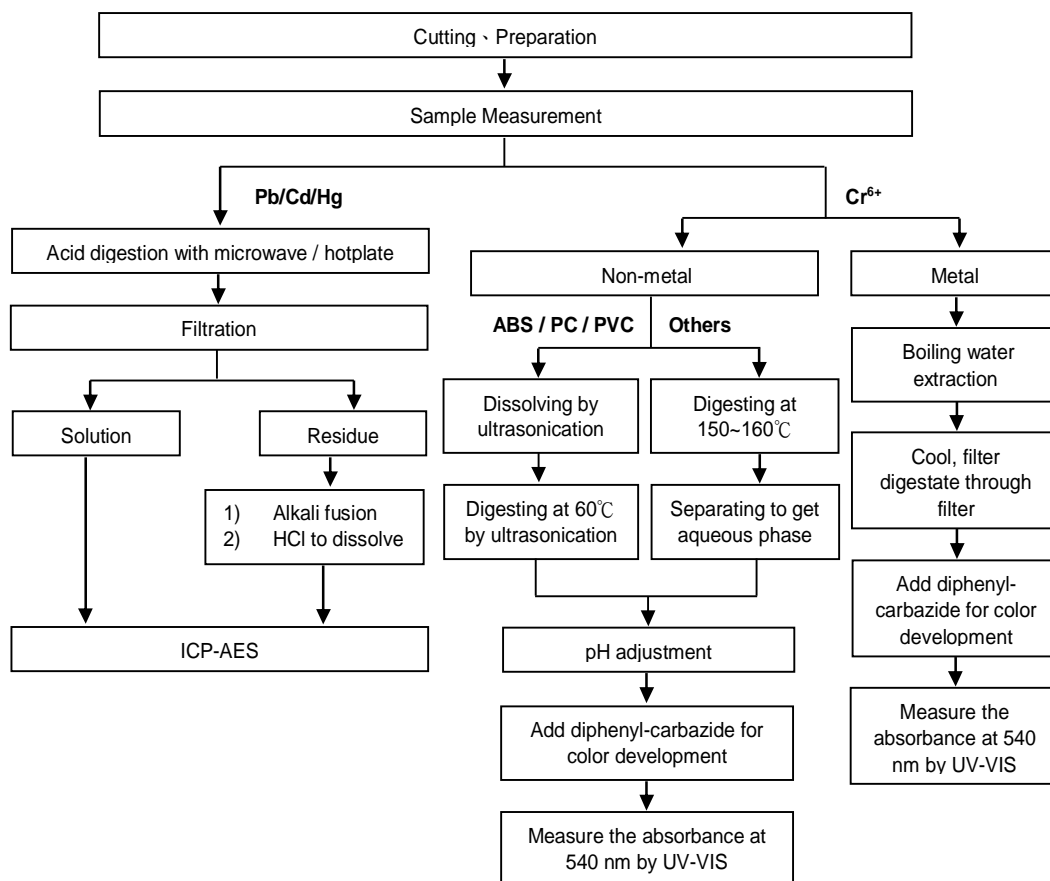


No.2

### Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)

- Technician : JR Wang
- Supervisor: Troy Chang



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## Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 6 of 9

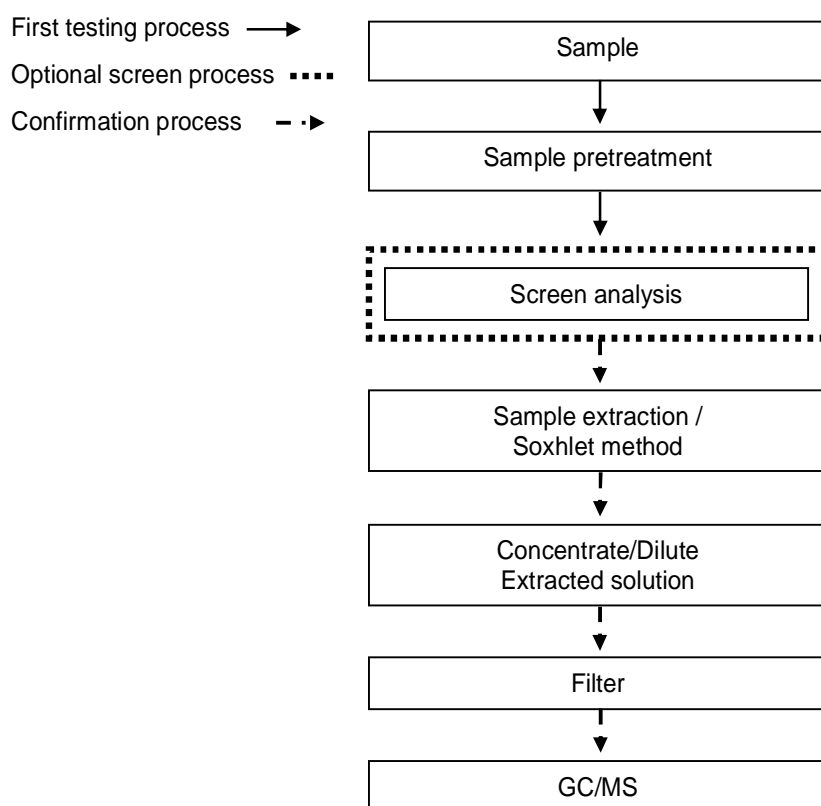
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### Analytical flow chart – PBB / PBDE

- Technician : Yaling Tu
- Supervisor: Troy Chang



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# Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 7 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

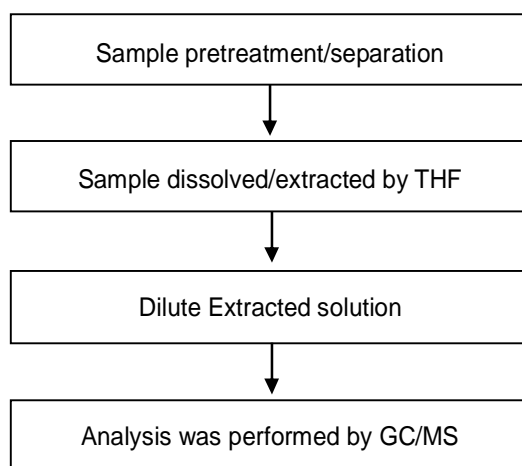
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## Analytical flow chart - Phthalate

- Technician: Andy Hsu
- Supervisor: Troy Chang

**【Test method: IEC 62321-8】**



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## Test Report

No. : CE/2018/35161

Date : 2018/03/27

Page : 8 of 9

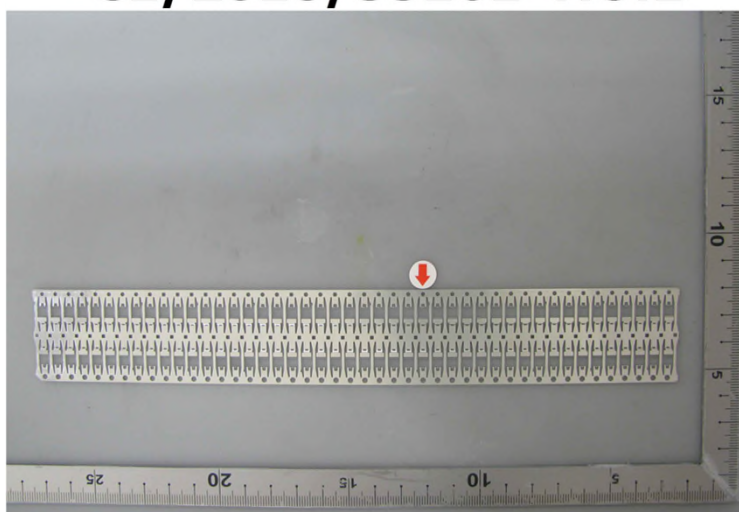
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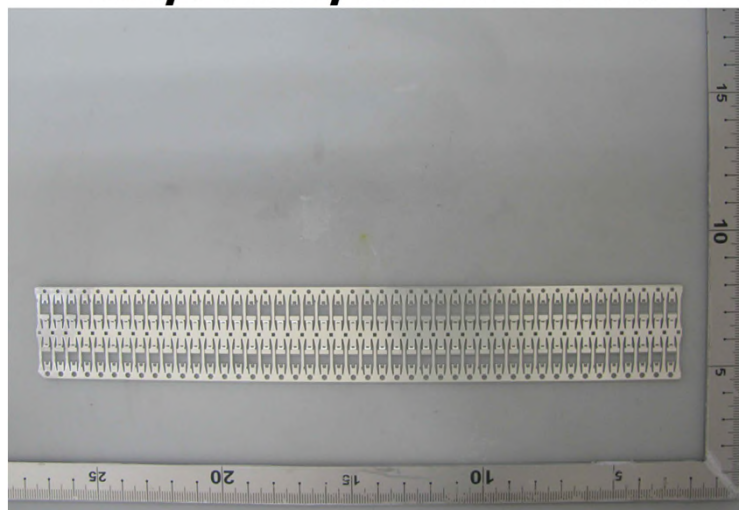


\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

### CE/2018/35161 NO.1



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## Test Report

No. : CE/2018/35161

Date : 2018/03/27

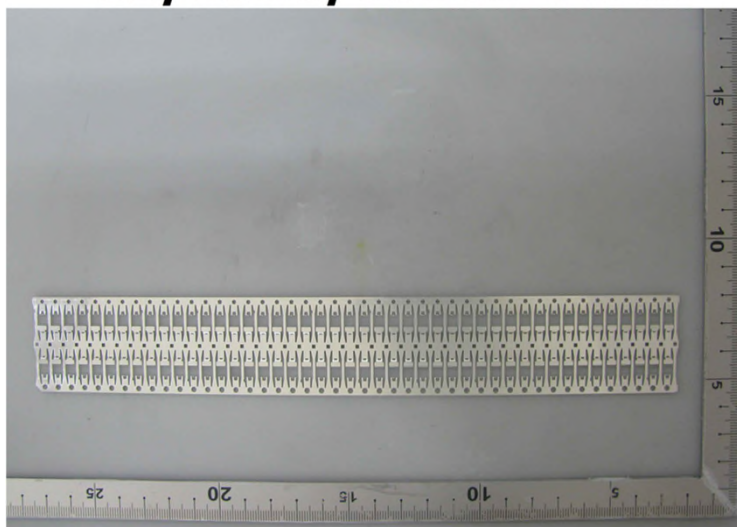
Page : 9 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

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### CE/2018/35161 NO.3



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

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