

Test Report

No. CANEC1416577301

Date: 13 Oct 2014

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TOPDIODE MANUFACTURING COMPANY LIMITED

ROOM 1318-19,HOLLYWOOD PLAZA,610 NATHAN ROAD,MONGKOK,KOWLOON,HK

The following sample(s) was/were submitted and identified on behalf of the clients as : FILM CAPACITOR

SGS Job No. : CP14-053806 - GZ

Model No. : CL11

Client Ref. Info. : FILM CAPACITOR

Date of Sample Received : 13 Jan 2014

Testing Period : 13 Jan 2014 - 17 Jan 2014

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

Yan

Yan Lee

Approved Signatory



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Test Results :

Test Part Description :

| Specimen No. | SGS Sample ID | Description |
|--------------|------------------|---------------------------------|
| SN1 | CAN14-165773.006 | Green material w/ grey printing |
| SN2 | CAN14-165773.007 | Silvery film(7#) |
| SN3 | CAN14-165773.008 | Silvery metal pin(8#) |

Remarks :

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive 2011/65/EU

- Test Method :
- (1)With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
 - (2)With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
 - (3)With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
 - (4)With reference to IEC 62321:2008, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
 - (5)With reference to IEC 62321:2008, determination of PBBs and PBDEs by GC-MS.

| <u>Test Item(s)</u> | <u>Limit</u> | <u>Unit</u> | <u>MDL</u> | <u>006</u> | <u>007</u> |
|----------------------------|--------------|-------------|------------|------------|------------|
| Cadmium (Cd) | 100 | mg/kg | 2 | ND | ND |
| Lead (Pb) | 1,000 | mg/kg | 2 | ND | ND |
| Mercury (Hg) | 1,000 | mg/kg | 2 | ND | ND |
| Hexavalent Chromium (CrVI) | 1,000 | mg/kg | 2 | ND | ND |
| Sum of PBBs | 1,000 | mg/kg | - | ND | ND |
| Monobromobiphenyl | - | mg/kg | 5 | ND | ND |
| Dibromobiphenyl | - | mg/kg | 5 | ND | ND |
| Tribromobiphenyl | - | mg/kg | 5 | ND | ND |
| Tetrabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Pentabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Hexabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Heptabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Octabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Nonabromobiphenyl | - | mg/kg | 5 | ND | ND |
| Decabromobiphenyl | - | mg/kg | 5 | ND | ND |



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| <u>Test Item(s)</u> | <u>Limit</u> | <u>Unit</u> | <u>MDL</u> | <u>006</u> | <u>007</u> |
|--------------------------|--------------|-------------|------------|------------|------------|
| Sum of PBDEs | 1,000 | mg/kg | - | ND | ND |
| Monobromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Dibromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Tribromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Tetrabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Pentabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Hexabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Heptabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Octabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Nonabromodiphenyl ether | - | mg/kg | 5 | ND | ND |
| Decabromodiphenyl ether | - | mg/kg | 5 | ND | ND |

Notes :

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II.

RoHS Directive 2011/65/EU

Test Method : (1)With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
 (2)With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
 (3)With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
 (4)With reference to IEC 62321:2008, determination of Hexavalent Chromium by spot test / Colorimetric Method using UV-Vis.

| <u>Test Item(s)</u> | <u>Limit</u> | <u>Unit</u> | <u>MDL</u> | <u>008</u> |
|----------------------------|--------------|-------------|------------|------------|
| Cadmium (Cd) | 100 | mg/kg | 2 | ND |
| Lead (Pb) | 1,000 | mg/kg | 2 | ND |
| Mercury (Hg) | 1,000 | mg/kg | 2 | ND |
| Hexavalent Chromium (CrVI) | - | - | ◇ | Negative |

Notes :

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II

(2)◇Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

Information on storage conditions and production date of the tested sample is unavailable and thus results



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of Cr(VI) represent status of the sample at the time of testing.

Hexabromocyclododecane (HBCDD)

Test Method : Determination of HBCDD by GC-MS based on IEC 62321:2008.

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>006</u> | <u>007</u> |
|--------------------------------|-------------|------------|------------|------------|
| Hexabromocyclododecane (HBCDD) | mg/kg | 10 | ND | ND |

Notes :

- (1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Hexabromocyclododecane (HBCDD) is considered as a priority for risk evaluation and substance restriction.

Phthalate

Test Method : Determination of phthalates by GC-MS based on EN 14372:2004.

| <u>Test Item(s)</u> | <u>CAS NO.</u> | <u>Unit</u> | <u>MDL</u> | <u>006</u> | <u>007</u> |
|-------------------------------------|----------------|-------------|------------|------------|------------|
| Dibutyl Phthalate (DBP) | 84-74-2 | %(w/w) | 0.003 | ND | ND |
| Benzylbutyl Phthalate (BBP) | 85-68-7 | %(w/w) | 0.003 | ND | ND |
| Bis-(2-ethylhexyl) Phthalate (DEHP) | 117-81-7 | %(w/w) | 0.003 | ND | ND |

Notes :

- (1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP) and Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

Remark: Results & photo(s) of this report refer to test report CANEC1400560303.



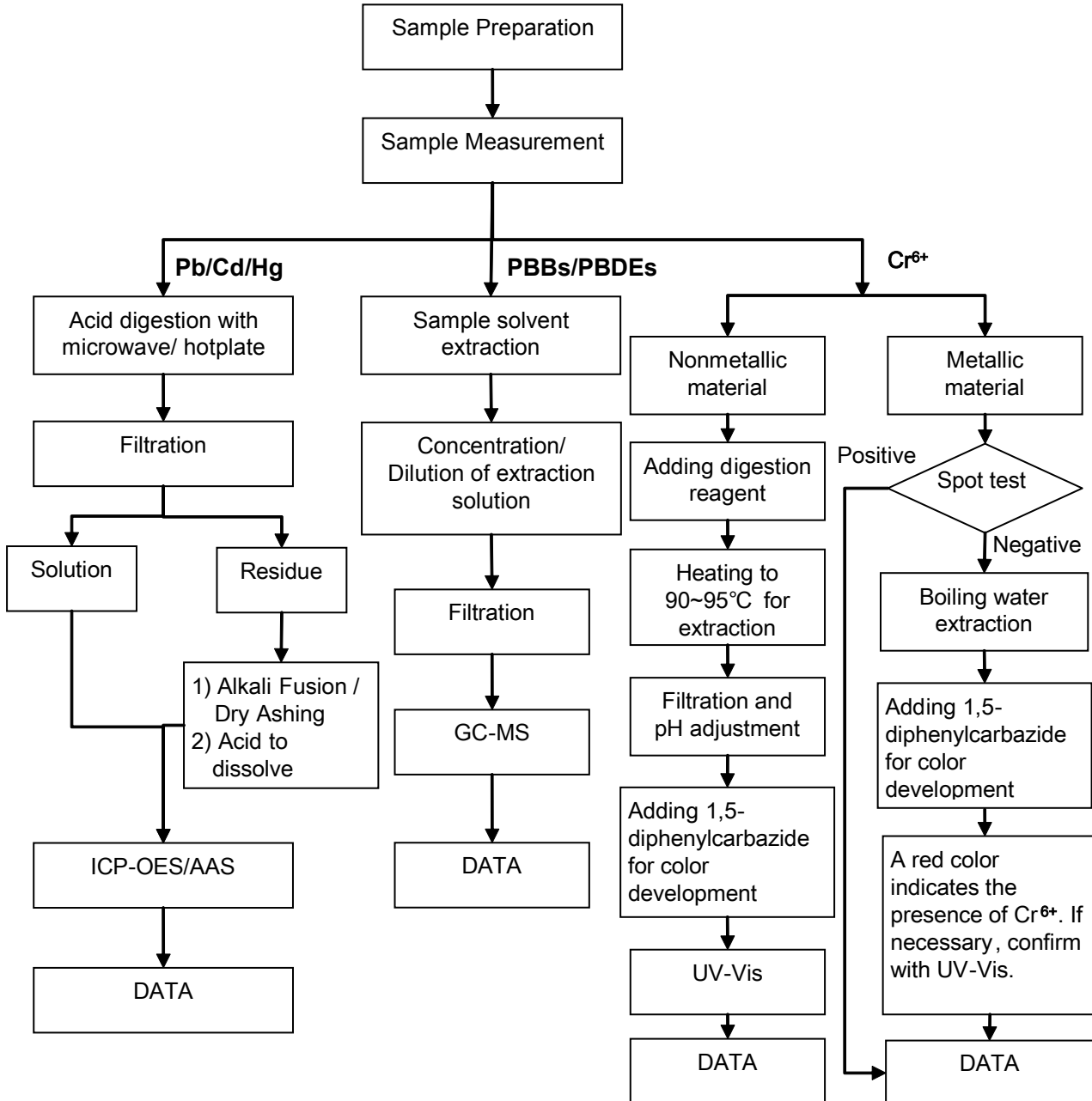
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RoHS Testing Flow Chart

- 1) Name of the person who made testing: Michael Tso / Cutey Yu
- 2) Name of the person in charge of testing: Adams Yu / Yolanda Wei
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr⁶⁺ and PBBs/PBDEs test method excluded).



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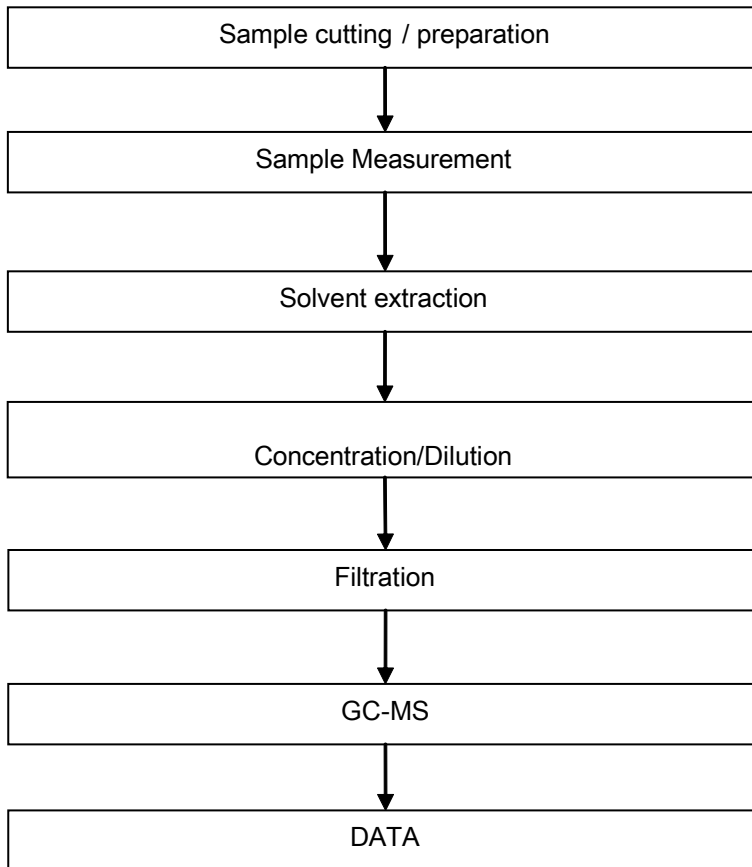
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HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Cutey Yu
- 2) Name of the person in charge of testing: Yolanda Wei



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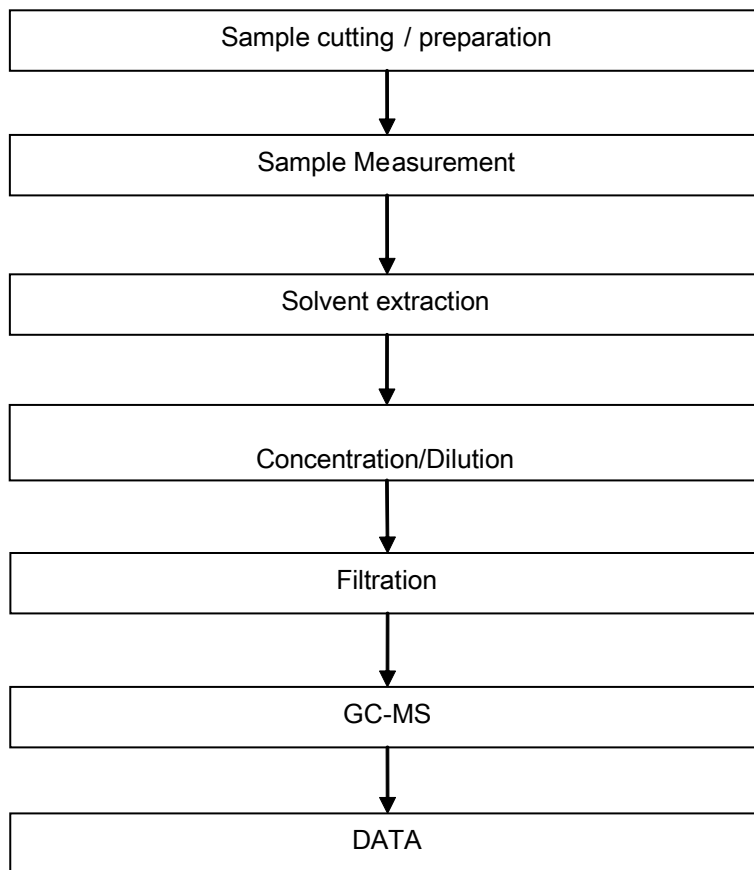
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Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Liu Qiong
- 2) Name of the person in charge of testing: Yolanda Wei

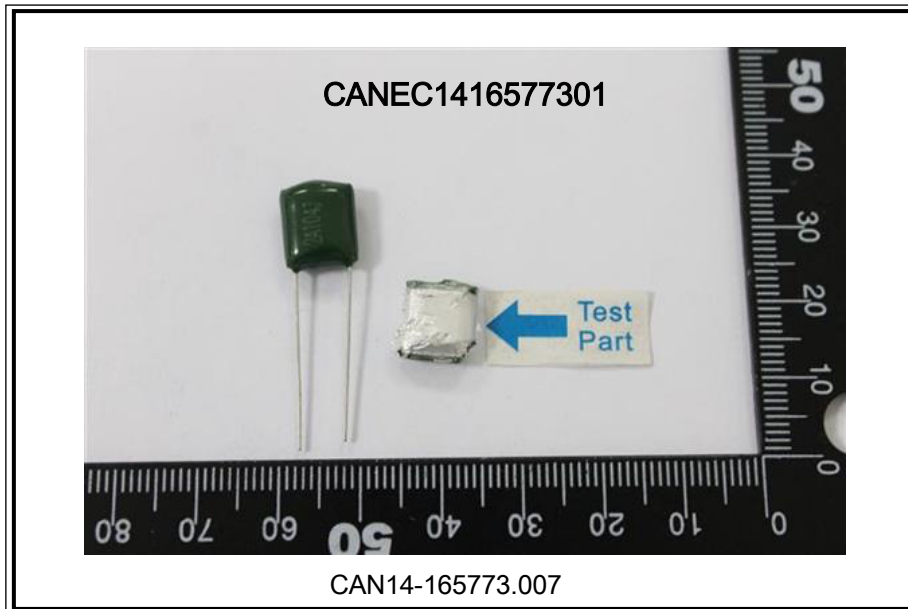
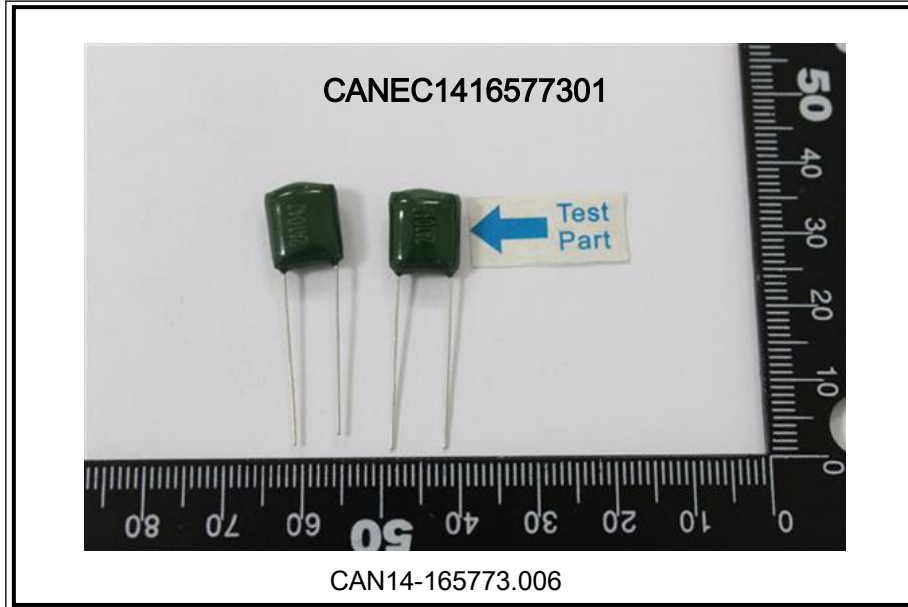


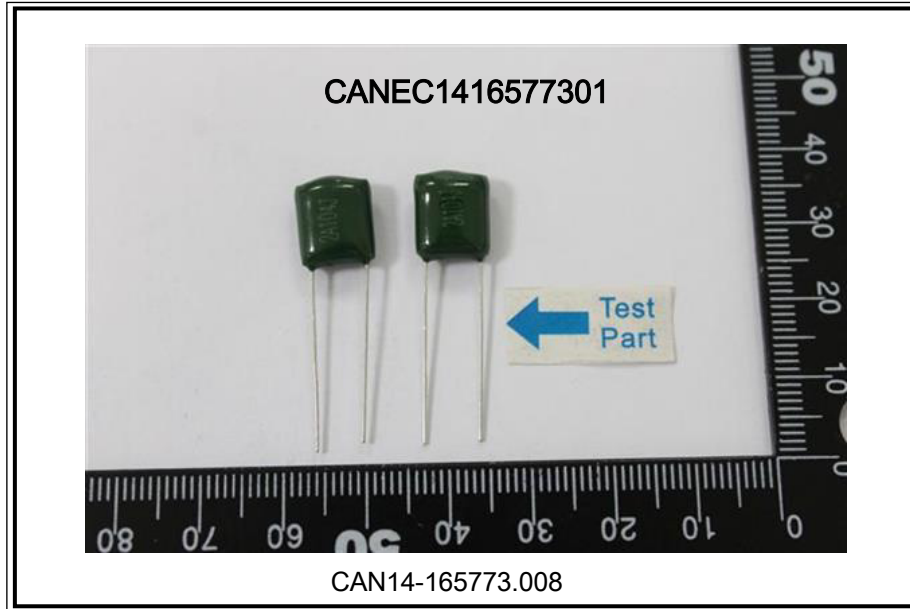
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