



ICP Test Report Certification Packet

Company Name: Littelfuse, Inc.

Product Type: Metal Oxide Varistors

Product Series: BA&BB Series RoHS Compliant models

Issue Date: August 20, 2012

It is hereby certified by Littelfuse, Inc. that there is neither RoHS(2011/65/EU)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes.

In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing processes, are all composed of the following components.

Issued by: *David Huang*
< DGLF Environmental, Health & Safety Engineer >

(1) Parts, sub-materials and unit parts

This document covers Metal Oxide Varistors BA&BB series RoHS-Compliant models manufactured by Littelfuse, Inc.

Please see Table 1 for raw materials used.

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1

Remarks :

Pb(lead) contained in glass of electronic components and is categorized as exempt under section 7(c)-I of the RoHS Annex.

Pb(lead) as an alloying element in aluminum containing up to 0.4 % lead by weight and is categorized as exempt under section 6(b) of the RoHS Annex.

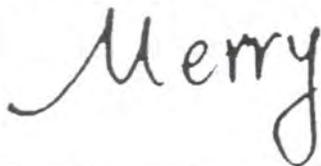
Table 1: List of Raw Materials covered by this report

| NO. | P/N | Raw Material Description | Page |
|------------|------------|--|-------------|
| 1 | N/A | D-Varistor | 3-8 |
| 2 | N/A | Gray Paste, for silver electrodes | |
| 3 | N/A | White power, for glass insulation | |
| 4 | N/A | Solder paste | 9-20 |
| 5 | N/A | Terminals | 21-25 |
| 6 | N/A | Industrial Casting Resin | 26-33 |
| 7 | N/A | Base & Lid, separating Copper Screw or Aluminum Fastener | 34-41 |
| 8 | N/A | Aluminum Fastener | 42-45 |
| 9 | N/A | Copper Screw | 46-49 |
| 10 | N/A | Screw & Washier | 50-53 |
| | | | |

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

SGS Job No. : CP11-007662 - GZ
Client Ref. Info. : Used for B72260D*
1.Ceramics, 2.Ag paste, 3.Glass coating
Date of Sample Received : 11 Nov 2011
Testing Period : 11 Nov 2011 - 21 Nov 2011
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).

Signed for and on behalf of
SGS-CSTC Ltd.



Merry Lv
Approved Signatory

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Test Results :

Test Part Description :

| Specimen No. | SGS Sample ID | Description |
|--------------|------------------|------------------------------------|
| 1 | CAN11-108169.015 | Dk-grey part(semi-product) |
| 2 | CAN11-108169.016 | Silver-grey material(semi-product) |
| 3 | CAN11-108169.017 | White powder(semi-product) |

Remarks :

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

Elementary Analysis & Flame Retardants

Test Method : With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs content by GC-MS.

| Test Item(s) | Unit | MDL | 015 | 016 | 017 |
|----------------------------|-------|-----|-----|-----|--------|
| Cadmium (Cd) | mg/kg | 2 | ND | ND | ND |
| Lead (Pb) | mg/kg | 2 | 18 | 8 | 243153 |
| Mercury (Hg) | mg/kg | 2 | ND | ND | ND |
| Hexavalent Chromium (CrVI) | mg/kg | 2 | 2 | ND | ND |
| Sum of PBBs | mg/kg | - | ND | ND | ND |
| Monobromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Dibromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Tribromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Tetrabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Pentabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Hexabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Heptabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Octabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Nonabromobiphenyl | mg/kg | 5 | ND | ND | ND |
| Decabromobiphenyl | mg/kg | 5 | ND | ND | ND |

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Test Report

No. CANEC1110816903

Date: 22 Nov 2011

Page 3 of 6

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>015</u> | <u>016</u> | <u>017</u> |
|--------------------------|-------------|------------|------------|------------|------------|
| Sum of PBDEs | mg/kg | - | ND | ND | ND |
| Monobromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Dibromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Tribromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Tetrabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Pentabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Hexabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Heptabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Octabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Nonabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |
| Decabromodiphenyl ether | mg/kg | 5 | ND | ND | ND |

Result Pb of specimen 3 is only for reference

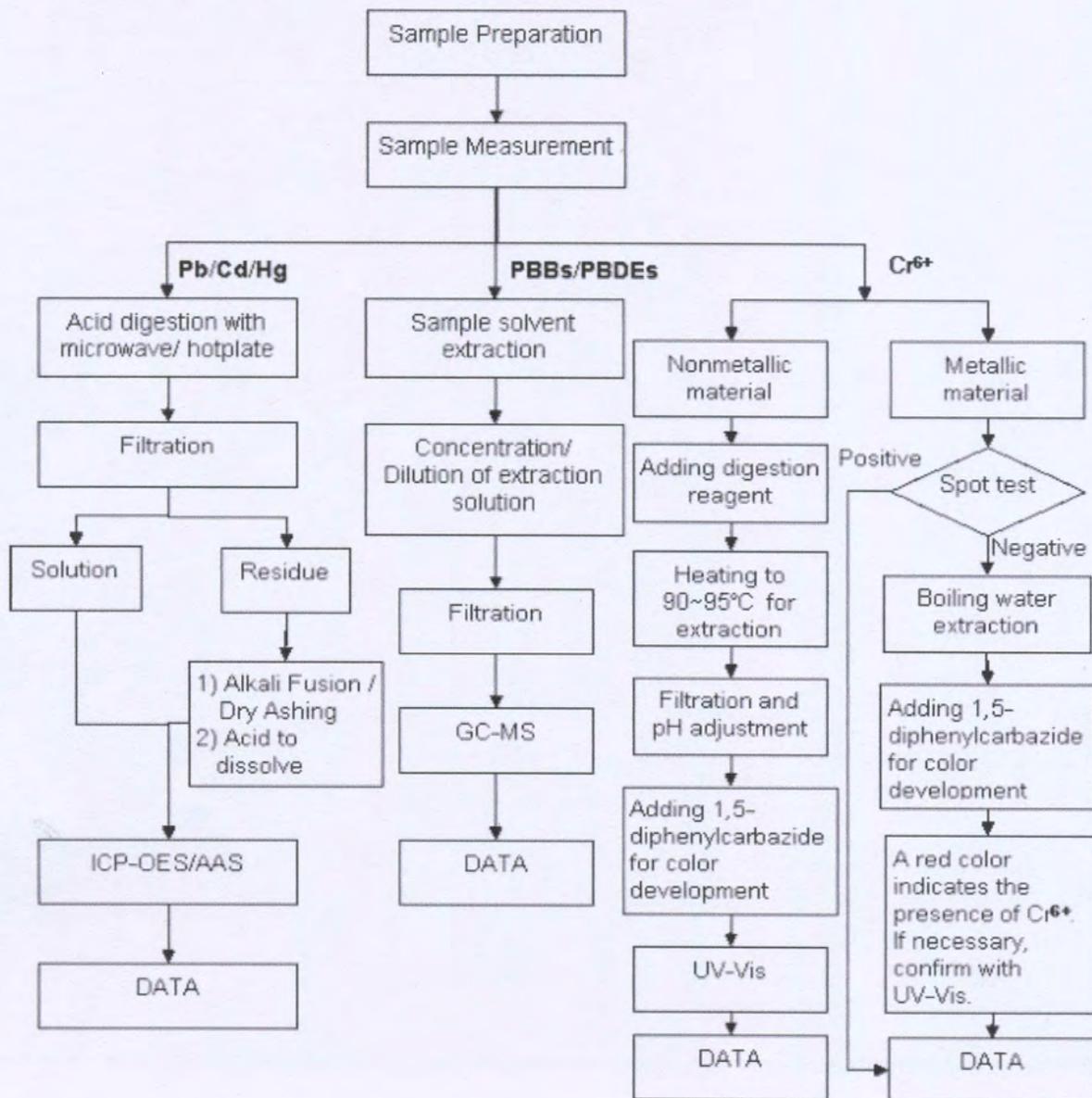
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ATTACHMENTS

RoHS Testing Flow Chart

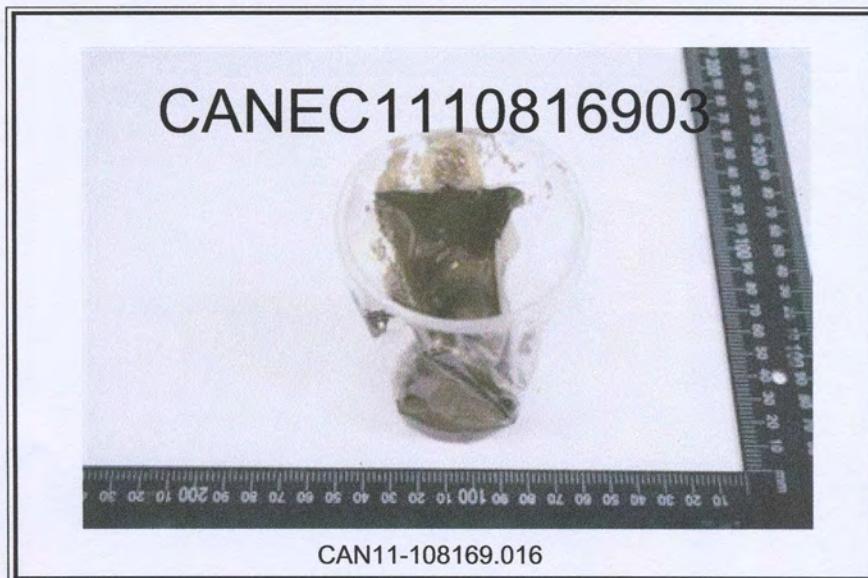
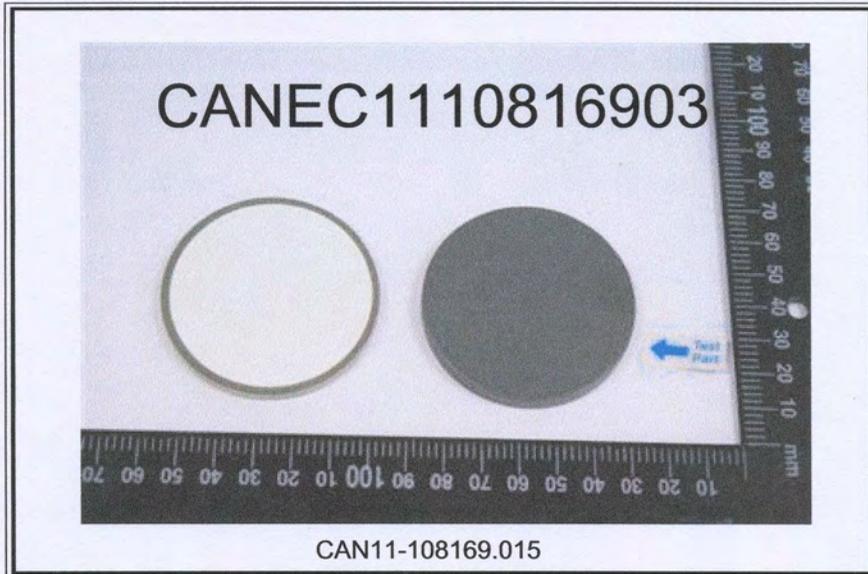
- 1) Name of the person who made testing: Bella Wang / Cutey Yu / Ross Zhan
- 2) Name of the person in charge of testing: Adams Yu / Ryan Yang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ and PBBs/PBDEs test method excluded).



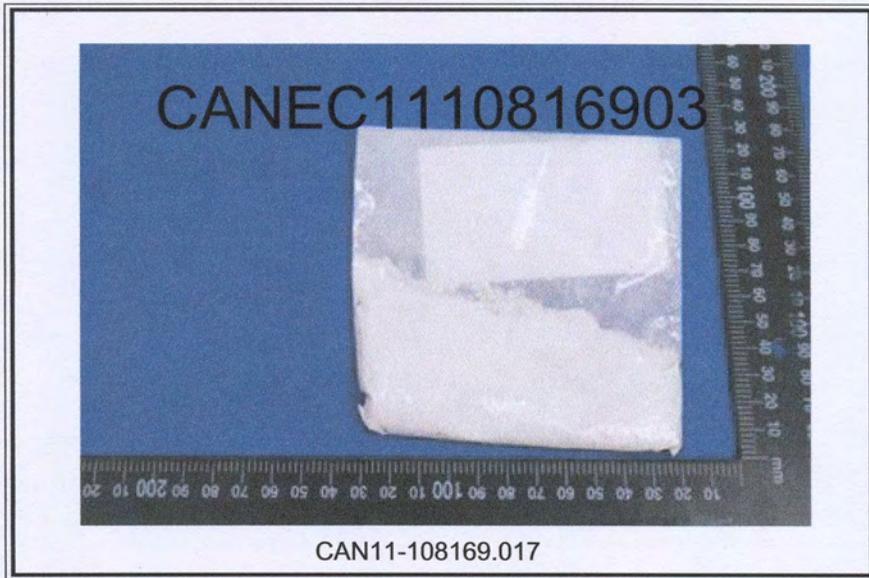
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Sample photo:



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SGS authenticate the photo on original report only

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Test Report

Report No. RLSZE001191100004

Page 1 of 4

Applicant DONGGUAN QIHANG XIYE MANUFACTURING CO.,LTD

Address NO.1 INDUSTRIAL AREA XIAGANG ,CHANG'AN TOWN ,DONGGUAN CITY

Report on the submitted sample(s) said to be

Sample Name LEAD-FREE SOLDER PASTE

Sample Description Gray paste

Part No. MIXTURE OF QH#LF96, QH#LF97, QH#LF98, QH#LF658, QH#LF601, QH#LT658, QH#LT601, QH#LT658C, QH#LF96H, QH#LF97H, QH#LF98H, QH#LF658H, QH#LF601H, QH#LT658H, QH#LT601H, QH#LT658CH

Color Silver

Sample Received Date Mar. 3, 2012

Testing Period Mar. 3, 2012 to Mar. 8, 2012

Test Requested As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) in the submitted sample(s).

Test Method

| Test Item(s) | Test Method | Measured Equipment(s) | MDL |
|---------------------------------------|-----------------------------|-----------------------|---------|
| Lead(Pb) | IEC 62321:2008 Ed.1 Sec.10 | ICP-OES | 2 mg/kg |
| Cadmium(Cd) | IEC 62321:2008 Ed.1 Sec.10 | ICP-OES | 2 mg/kg |
| Mercury(Hg) | IEC 62321:2008 Ed.1 Sec.7 | ICP-OES | 2 mg/kg |
| Hexavalent Chromium(Cr(VI)) | IEC 62321:2008 Ed.1 Annex C | UV-Vis | 2 mg/kg |
| Polybrominated Biphenyls(PBBs) | IEC 62321:2008 Ed.1 Annex A | GC-MS | 5 mg/kg |
| Polybrominated Diphenyl Ethers(PBDEs) | IEC 62321:2008 Ed.1 Annex A | GC-MS | 5 mg/kg |

Test Result(s) Please refer to the following page(s).

Conclusion:

| Tested Sample | According to directive | Result |
|------------------|------------------------|--------|
| Submitted Sample | 2011/65/EU* | Pass |

*=July 1, 2011, the EU Official Journal (OJ) released the directive 2011/65/EU which as a new version of RoHS Directive (2002/95/EC). The revised directive has entered into force on the twentieth day after its publication in the OJ.

Tested by Rick Inspected by Vargas
 Approved by Danli Date Mar. 8, 2012
 Technical Manager



No. 11363955

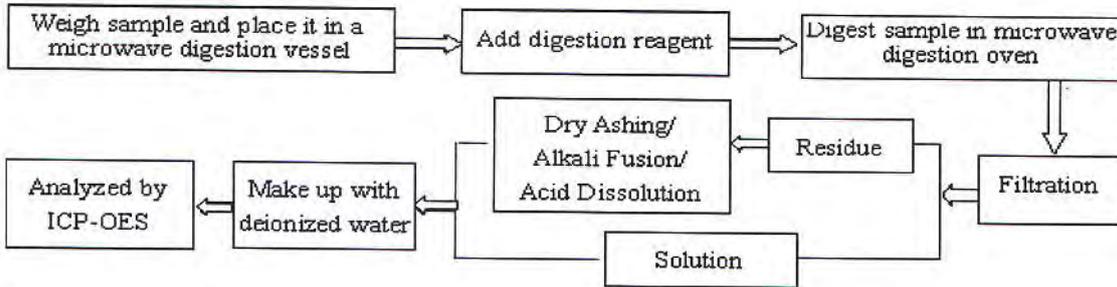
Test Report

Report No. RLSZE001191100004

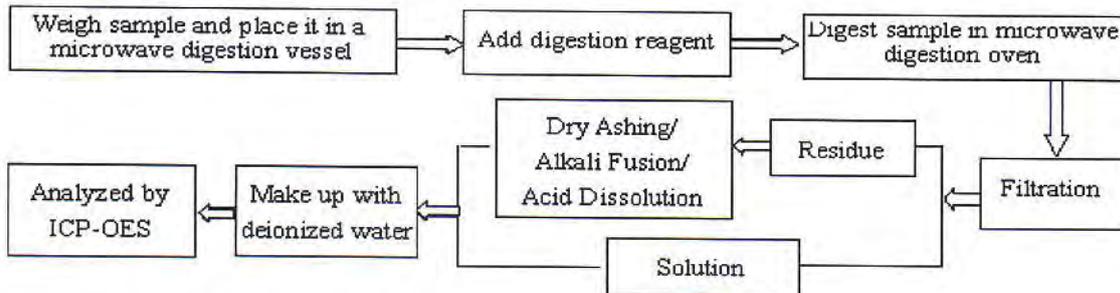
Page 3 of 4

Test Process

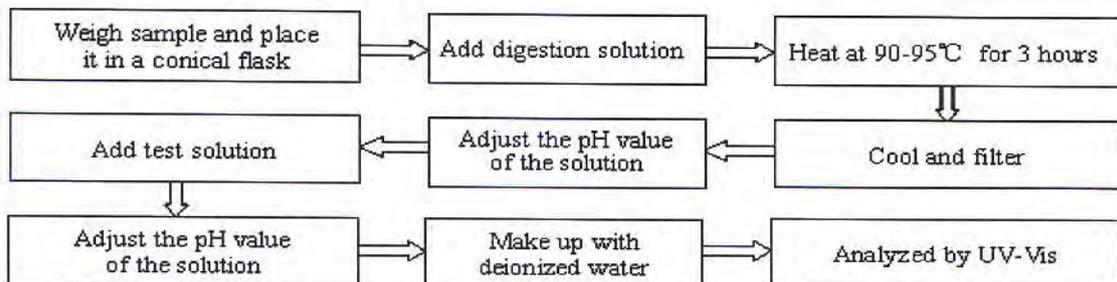
1. Lead(Pb), Cadmium(Cd)



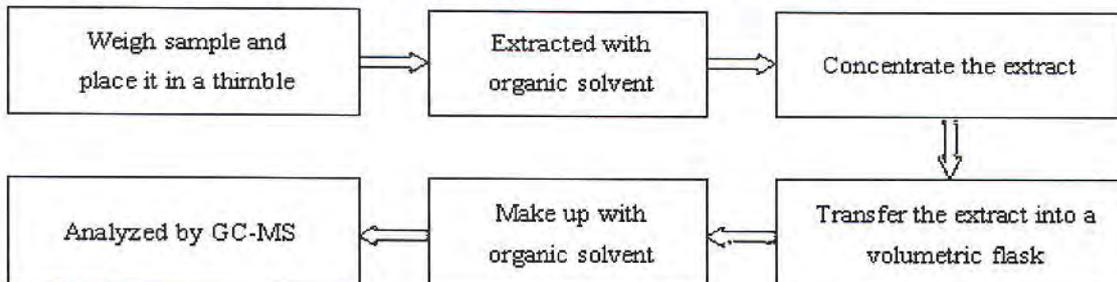
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))



4. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs)



Test Report

Report No. RLSZE001191100004

Page 4 of 4

Photo(s) of the sample(s)



*** End of report ***

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Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen

Test Report

Report No. RLSZE001296390001

Page 1 of 3

Applicant DONGGUAN QIHANG XIYE MANUFACTURING CO.,LTD
Address NO.1 INDUSTRIAL AREA XIAGANG ,CHANG'AN TOWN ,DONGGUAN CITY

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

Sample Name LEAD-FREE SOLDER PASTE
 COLOR silver
 Material TIN
 Sample Received Date May. 25, 2012
 Testing Period May. 25, 2012 to May. 29, 2012

Test Requested As specified by client, to test Fluorine(F), Chlorine(Cl), Bromine(Br), Iodine(I) in the submitted sample(s).

Test Method

| Test Item(s) | Test Method | Measured Equipment(s) | MDL |
|--------------|---------------------------|-----------------------|----------|
| Fluorine(F) | Refer to BS EN 14582:2007 | IC | 10 mg/kg |
| Chlorine(Cl) | Refer to BS EN 14582:2007 | IC | 10 mg/kg |
| Bromine(Br) | Refer to BS EN 14582:2007 | IC | 10 mg/kg |
| Iodine(I) | Refer to BS EN 14582:2007 | IC | 10 mg/kg |

Test Result(s) Please refer to the following page(s).

Tested by Rick Li Reviewed by Vargus He
 Approved by Danny Liu Date May. 29, 2012
 Danny Liu
 Technical Manager



No. 38791053

Test Report

Report No. RLSZE001296390001

Page 2 of 3

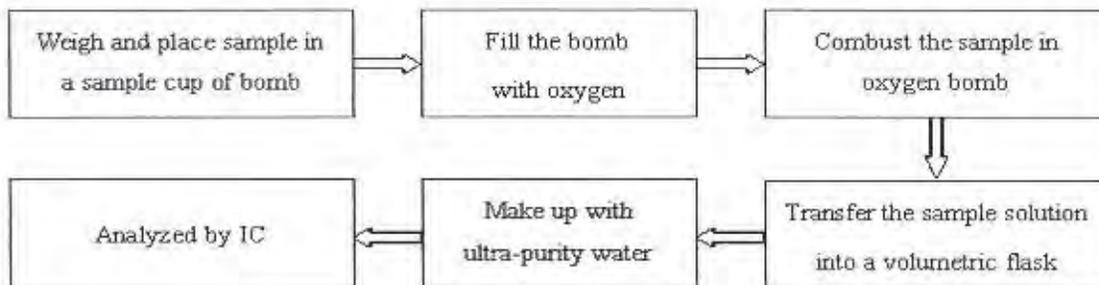
Test Result(s)

| Tested Item(s) | Content |
|-------------------|---------|
| Halogen(s) | |
| Fluorine (F) | N.D. |
| Chlorine (Cl) | N.D. |
| Bromine (Br) | N.D. |
| Iodine (I) | N.D. |

Tested Sample/Part Description Gray paste

Note:
 -MDL = Method Detection Limit
 -N.D. = Not Detected (<MDL)
 -mg/kg = ppm = parts per million

Test Process



Test Report

Report No. RLSZE001296390001

Page 3 of 3

Photo(s) of the sample(s)



*** End of report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

Test Report

No. CANEC1204755001

Date: 27 Apr 2012

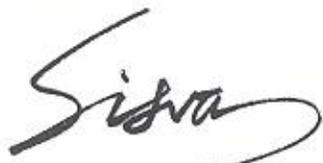
Page 1 of 5

DONGGUAN QI HANG XI YE MANUFACTURING CO.,LTD
NO.1 INDUSTRIAL PARK,XIAGANG,CHANGAN TOWN,DONGGUAN CITY
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : Lead Free Solder Paste

SGS Job No. : CP12-017386 - GZ
Date of Sample Received : 23 Apr 2012
Testing Period : 23 Apr 2012 - 27 Apr 2012
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).

Signed for and on behalf of
SGS-CSTC Ltd.



Silva Zhou
Approved Signatory

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Test Results :

Test Part Description :

| Specimen No. | SGS Sample ID | Description |
|--------------|------------------|-------------|
| 1 | CAN12-047550.001 | Grey paste |

Remarks :

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

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>001</u> |
|--------------------------------|-------------|------------|------------|
| Hexabromocyclododecane (HBCDD) | mg/kg | 10 | 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.

Phthalates

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

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|-------------------------------------|-------------|------------|------------|
| Dibutyl Phthalate (DBP) | % (w/w) | 0.003 | ND |
| Benzylbutyl Phthalate (BBP) | % (w/w) | 0.003 | ND |
| Bis-(2-ethylhexyl) Phthalate (DEHP) | % (w/w) | 0.003 | 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 : The result(s) shown is/are of the total weight of wet sample.

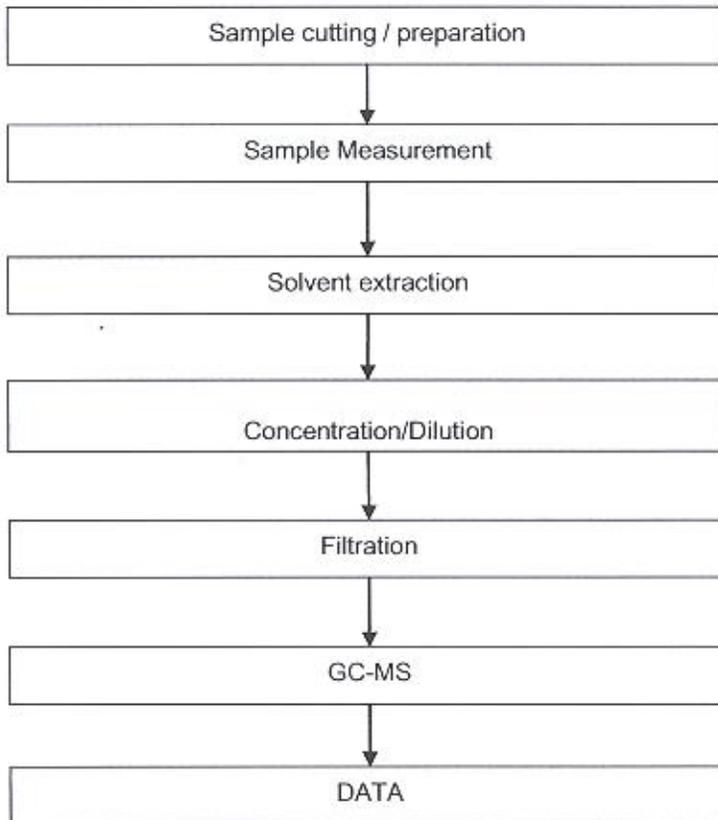
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ATTACHMENTS

HBCDD Testing Flow Chart

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



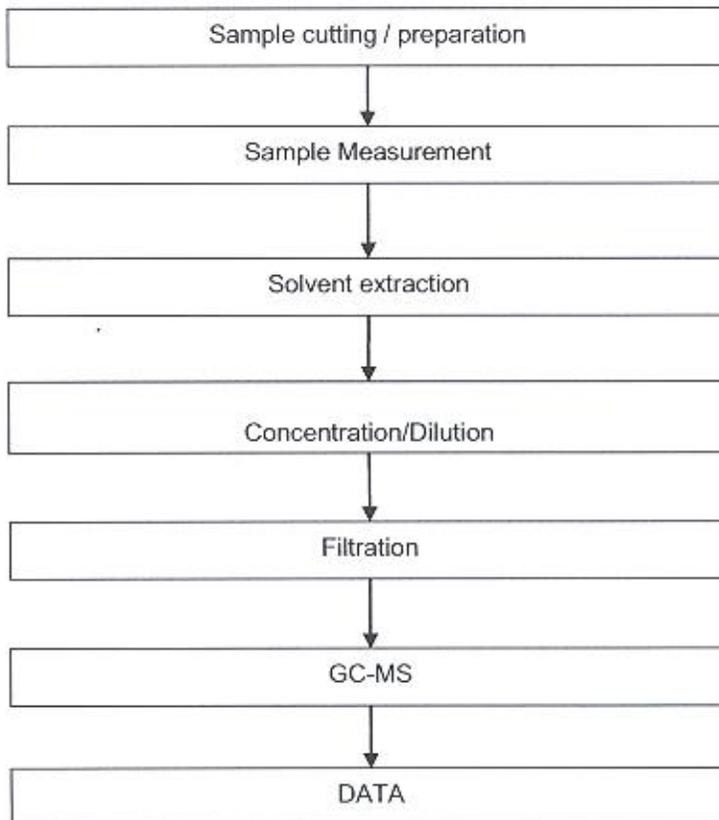
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ATTACHMENTS

Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Tina Zhao
- 2) Name of the person in charge of testing: Ryan Yang



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Sample photo:



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Test Report

Number: SZHH0071861302

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Aug 15, 2012

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

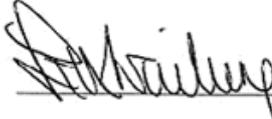
Sample Description:
One (1) submitted sample said to be **terminals**.
Tested component: silver-grey plated metal.



Tests conducted:
As requested by the applicant, refer to attached page(s) for details.

| | | |
|--------------------------------------|---|---------------|
| Conclusion: | | |
| <u>Tested Samples</u> | <u>Standard</u> | <u>Result</u> |
| Tested component of submitted sample | Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2002/95/EC and superseding 2011/65/EU) | Pass |

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.




Ben N.L. Lin
General Manager



Test Report

Number: SZHH0071861302

Tests Conducted

RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|---|------------------|
| Cadmium (Cd) Content (mg/kg) | ND(<2) |
| Lead (Pb) Content (mg/kg) | ND(<2) |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)(mg/kg with 50cm ²) | Negative (<0.02) |

Chemist: Wang Haijun

mg/kg = milligram per kilogram = ppm
mg/kg with 50cm² = milligram per kilogram with 50 square centimetre
< = Less than
ND = Not detected

Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedure or 0.02 mg/kg for boiling-water-extraction procedures with a sample surface area of 50cm² used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.

Negative = A negative test result indicated above positive observation was not found at the time of testing. When the spot-test showed a negative result, the boiling-water-extraction procedure shall be used to verify the result.

(B) RoHS Requirement:

| Restricted Substances | Limits |
|-----------------------------------|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |

The above limits were quoted from 2002/95/EC and superseding 2011/65/EU for homogeneous material.



Test Report

Number: SZHH0071861302

Tests Conducted

(C) Test Method:

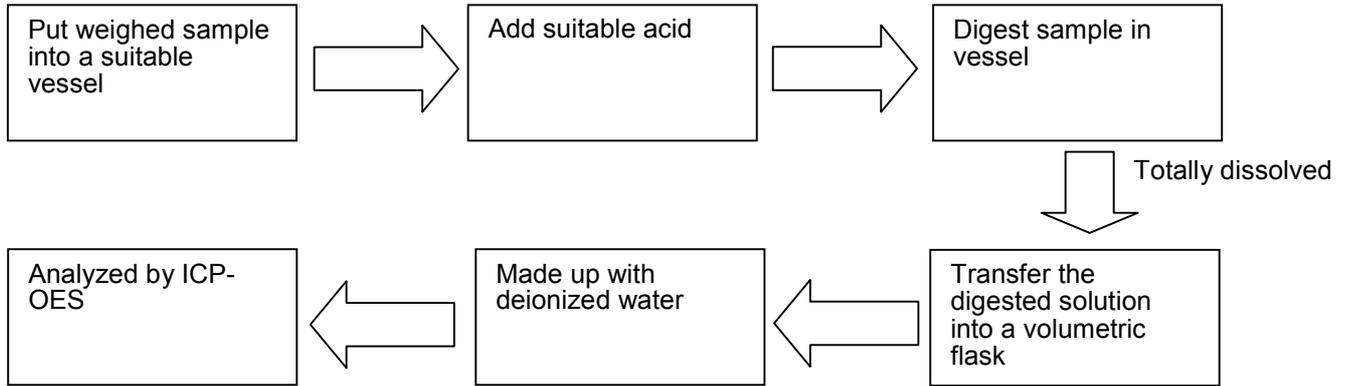
| Testing Item | Testing Method | Reporting Limit |
|---|--|--|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI) (Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by boiling water extraction and determined by UV-VIS Spectrophotometer | Positive/Negative (Threshold of 0.02mg/kg with 50cm ²) |

Date sample received: Aug 10, 2012
Testing period : Aug 10, 2012 to Aug 13, 2012

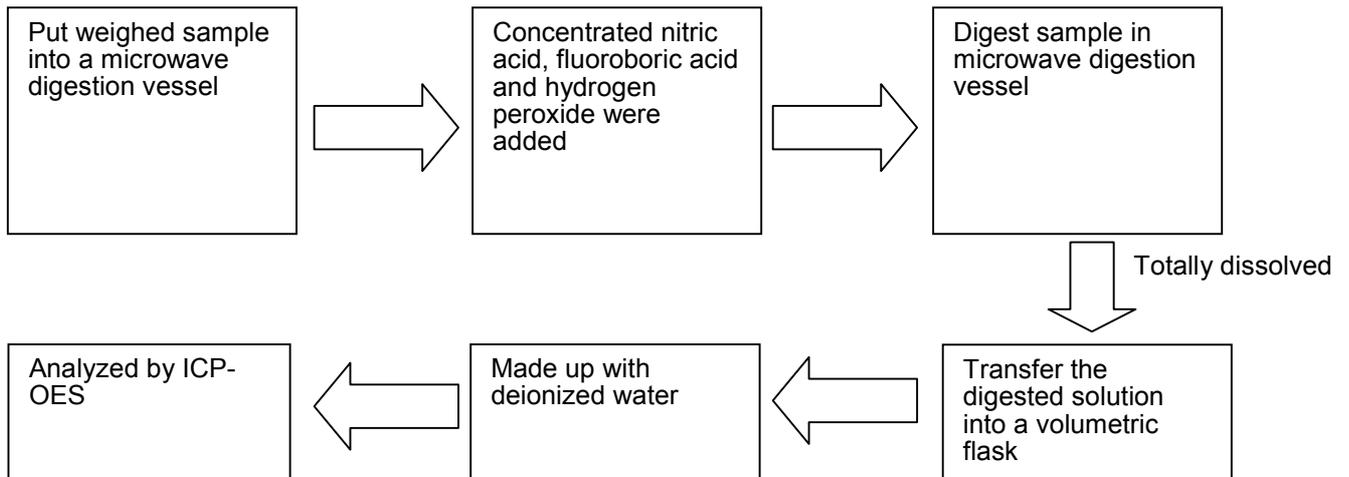
Tests Conducted

(D) Measurement Flowchart:

1. Test for Cd/Pb Contents

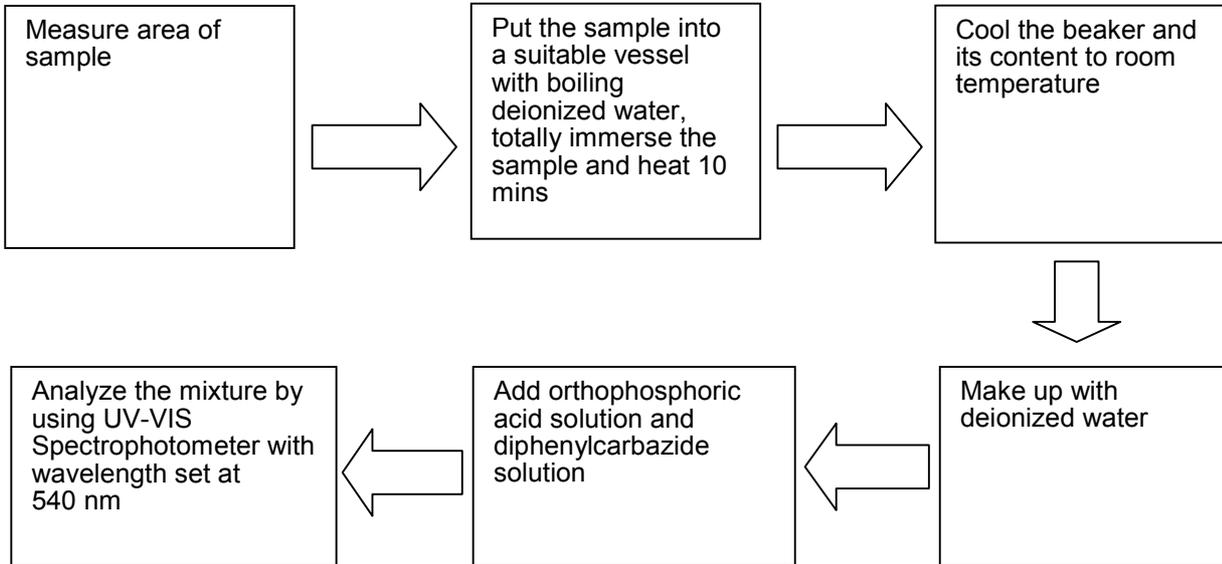


2. Test for Hg Content



Tests Conducted

3. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)



End of Report

This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or wilful misconduct.



Test Report

Number: SZHH0071859101

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Aug 16, 2012

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

Sample Description:

One (1) submitted sample said to be **dark grey resin coating (industrial coating resin).**



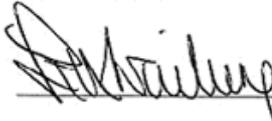
Tests conducted:

As requested by the applicant, refer to attached page(s) for details.

Conclusion:

| <u>Tested Sample</u> | <u>Standard</u> | <u>Result</u> |
|----------------------|---|--------------------|
| Submitted sample | Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2002/95/EC and superseding 2011/65/EU) | See test conducted |
| | Phthalates content requirement in Annex XVII Items 51 & 52 of the REACH Regulation (EC) No. 1907/2006 & Amendment No. 552/2009 (formerly known as Directive 2005/84/EC) (DEHP, DBP & BBP) | Pass |
| | <u>Test Item</u> Hexabromocyclododecane Content | See test conducted |
| | Halogen (F, Cl, Br, I) Content | See test conducted |

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.




Ben N.L. Lin
General Manager



Test Report

Number: SZHH0071859101

Tests Conducted

1 RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|--|--------|
| Cadmium (Cd) Content (mg/kg) | ND(<2) |
| Lead (Pb) Content (mg/kg) | ND(<2) |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Content (mg/kg) | ND(<1) |
| Polybrominated Biphenyls (PBBs)(mg/kg) | |
| Monobromobiphenyl (MonoBB) | ND(<5) |
| Dibromobiphenyl (DiBB) | ND(<5) |
| Tribromobiphenyl (TriBB) | ND(<5) |
| Tetrabromobiphenyl (TetraBB) | ND(<5) |
| Pentabromobiphenyl (PentaBB) | ND(<5) |
| Hexabromobiphenyl (HexaBB) | ND(<5) |
| Heptabromobiphenyl (HeptaBB) | ND(<5) |
| Octabromobiphenyl (OctaBB) | ND(<5) |
| Nonabromobiphenyl (NonaBB) | ND(<5) |
| Decabromobiphenyl (DecaBB) | ND(<5) |
| Polybrominated Diphenyl Ethers (PBDEs)(mg/kg) | |
| Monobromodiphenyl Ether (MonoBDE) | ND(<5) |
| Dibromodiphenyl Ether (DiBDE) | ND(<5) |
| Tribromodiphenyl Ether (TriBDE) | ND(<5) |
| Tetrabromodiphenyl Ether (TetraBDE) | ND(<5) |
| Pentabromodiphenyl Ether (PentaBDE) | ND(<5) |
| Hexabromodiphenyl Ether (HexaBDE) | ND(<5) |
| Heptabromodiphenyl Ether (HeptaBDE) | ND(<5) |
| Octabromodiphenyl Ether (OctaBDE) | ND(<5) |
| Nonabromodiphenyl Ether (NonaBDE) | ND(<5) |
| Decabromodiphenyl Ether (DecaBDE) | ND(<5) |

Chemist: Wang Haijun/Zeng Guoliang

mg/kg = milligram per kilogram = ppm

< = Less than

ND = Not detected



Test Report

Number: SZHH0071859101

Tests Conducted

(B) RoHS Requirement:

| Restricted Substances | Limits |
|--|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000 mg/kg) |
| Polybrominated Diphenyl Ethers (PBDEs) | 0.1% (1000 mg/kg) |

The above limits were quoted from 2002/95/EC and superseding 2011/65/EU for homogeneous material.

(C) Test Method:

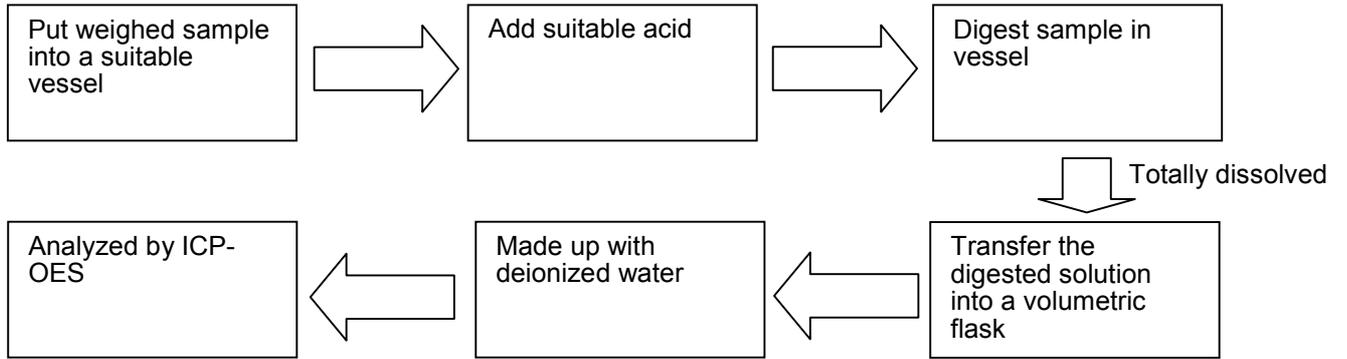
| Testing Item | Testing Method | Reporting Limit |
|---|--|-----------------|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI)(Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by alkaline digestion and determined by UV-VIS Spectrophotometer | 1 mg/kg |
| Polybrominated Biphenyls (PBBs)& Polybrominated Diphenyl Ethers (PBDEs) | With reference to IEC 62321 Edition 1.0:2008, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary | 5 mg/kg |

Date sample received: Aug 10, 2012
Testing period: Aug 10, 2012 to Aug 13, 2012

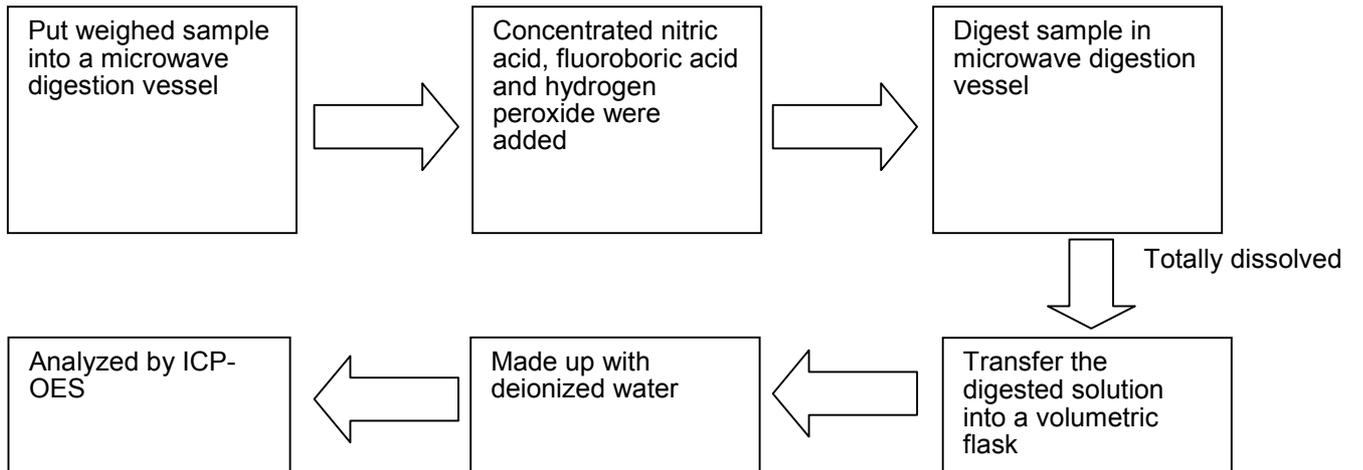
Tests Conducted

(D) Measurement Flowchart:

1. Test for Cd/Pb Contents

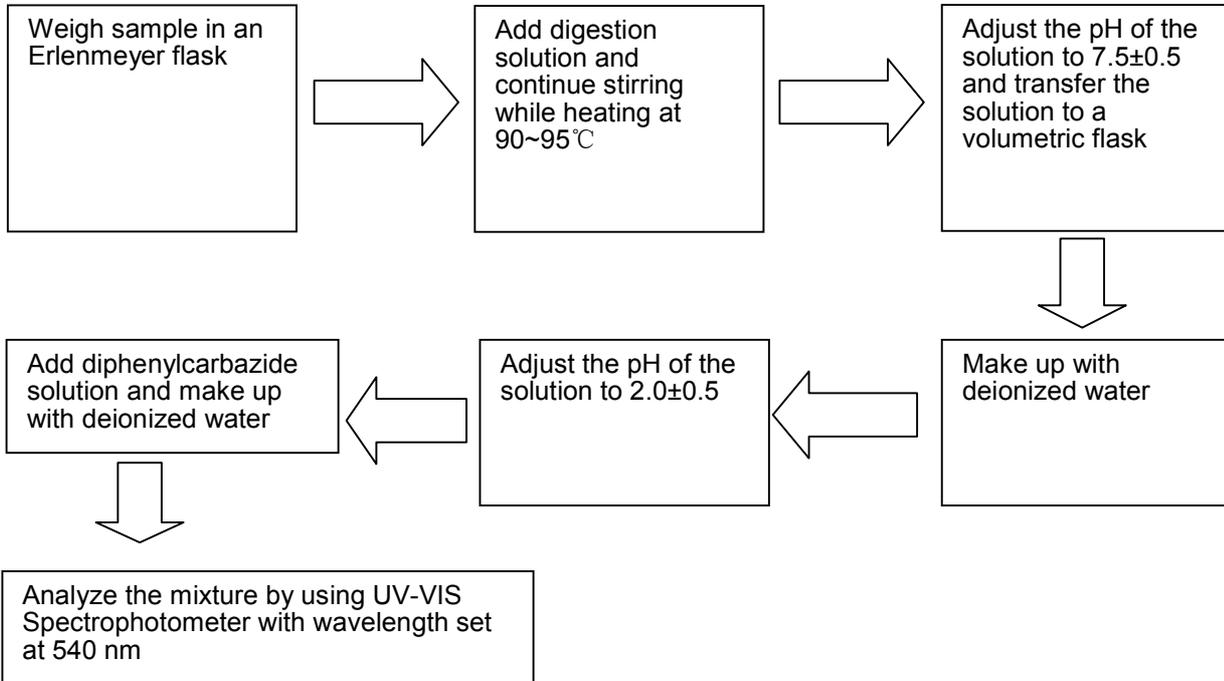


2. Test for Hg Content

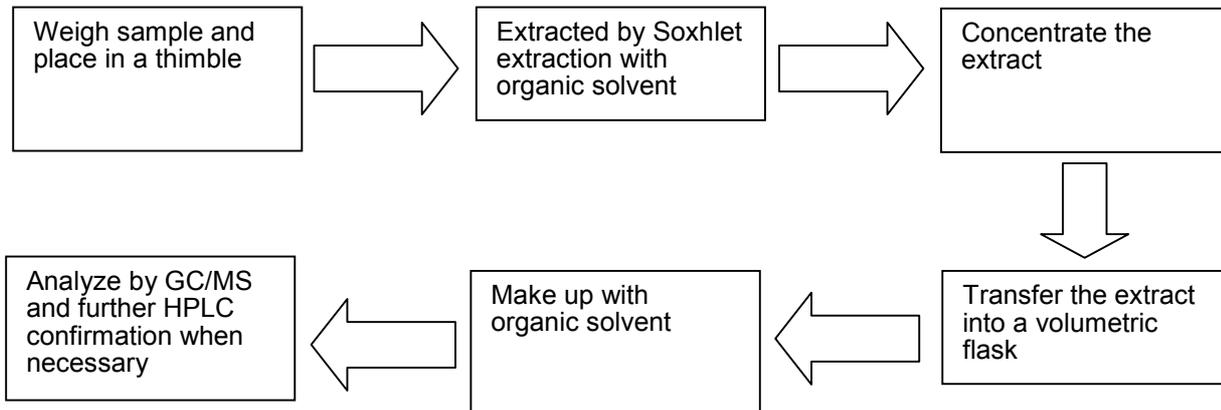


Tests Conducted

3. Test for Chromium (VI) (Cr⁶⁺) Content (Alkaline Digestion)



4. Test for PBBs/PBDEs Contents





Test Report

Number: SZHH0071859101

Tests Conducted

2 Phthalate Content

With reference to EN14372, by Gas chromatographic-Mass Spectrometric (GC-MS) analysis.

| | <u>Result (%)</u> |
|-------------------------------------|-------------------|
| Dibutyl phthalate (DBP) | <0.01 |
| Di-(2-ethyl hexyl) phthalate (DEHP) | <0.01 |
| Benzyl butyl phthalate (BBP) | <0.01 |
| Sum of three phthalates | <0.01 |
| Limit | 0.1 % |

The above limit was quoted according to Annex XVII Items 51 & 52 of the REACH Regulation (EC) No. 1907/2006 & Amendment No. 552/2009(formerly known as Directive 2005/84/EC) for phthalate content in toys and children articles.

< = Less than

Date sample received :Aug 10, 2012
Testing period :Aug 10, 2012 to Aug 15, 2012

3 Hexabromocyclododecane (HBCDD) Content:

By solvent extraction followed by Gas Chromatographic - Mass Spectrometric (GC-MS) analysis.

Result : Less than 10 mg/kg

mg/kg =milligram per kilogram

Date sample received: Aug 10, 2012
Testing period: Aug 10, 2012 to Aug 14, 2012



Test Report

Number: SZHH0071859101

Tests Conducted

4 Halogen Content

(I) Test Result Summary:

| <u>Testing Item</u> | <u>Result (mg/kg)</u> |
|-----------------------|-----------------------|
| Fluorine (F) Content | ND |
| Chlorine (Cl) Content | ND |
| Bromine (Br) Content | ND |
| Iodine (I) Content | ND |

mg/kg= milligram per kilogram = ppm
ND= Not detected

(II) Test Method:

| <u>Testing Item</u> | <u>Testing Method</u> | <u>Reporting Limit</u> |
|--------------------------------|---|------------------------|
| Halogen (F, Cl, Br, I) Content | With reference to BS EN 14582:2007, by calorimetric bomb and determined by Ion Chromatography | 50 mg/kg |

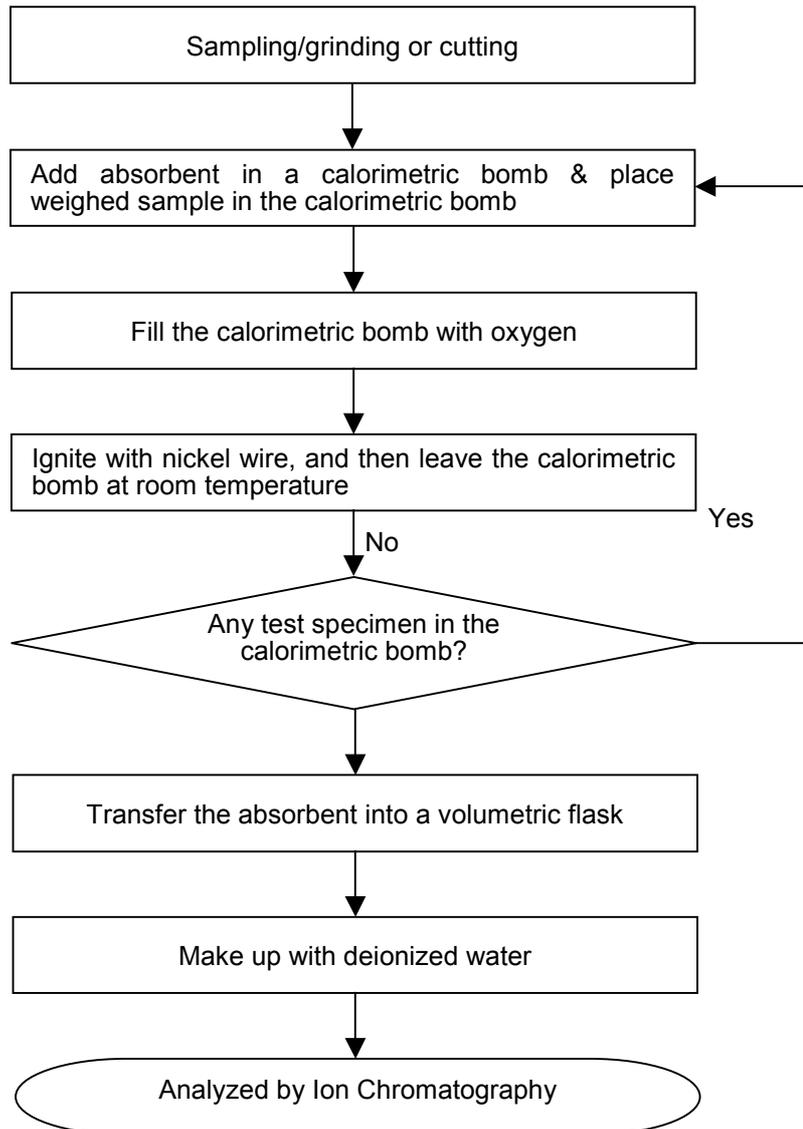
Reporting limit = Quantitation limit of analyte in sample

Date sample received :Aug 10, 2012
Testing period :Aug 10, 2012 to Aug 14, 2012

Tests Conducted

(III) Measurement Flowchart:

Test for Halogen Content (Reference Method: BS EN 14582:2007)



End of report

This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or wilful misconduct.



Test Report

Number: SZHH00651966

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Dec 15, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

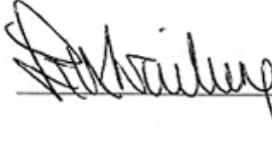
Sample Description:
One (1) submitted sample said to be **base & lid**.
Tested components:
(1) red plastic. (base)
(2) red plastic. (lid)



Tests conducted:
As requested by the applicant, refer to attached page(s) for details.

To be continued

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.




Ben N.L. Lin
General Manager



Test Report

Number: SZHH00651966

Conclusion:

| <u>Tested Sample</u> | <u>Standard</u> | <u>Result</u> |
|----------------------|---|--------------------|
| Submitted sample | Phthalates content requirement in Annex XVII Items 51 & 52 of the REACH Regulation (EC) No. 1907/2006 & Amendment No. 552/2009 (formerly known as Directive 2005/84/EC) (DEHP, DBP & BBP) | Pass |
| | <u>Test Item</u> Hexabromocyclododecane Content | See Test Conducted |
| | Halogen Content | See Test Conducted |
| | Restriction of the use of certain hazardous substance in electrical electronic and equipment (RoHS Direction 2002/95/EC and amendment 2005/618/EC) | See Test Conducted |

 Remark As requested by the applicant, tested components (1) and (2) were tested together.

Authorized by:
 For Intertek Testing Services
 Shenzhen Ltd.



Ben N.L. Lin
 General Manager



Test Report

Number: SZHH00651966

Tests Conducted

1 RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|--|--------|
| | (1/2) |
| Cadmium (Cd) Content (mg/kg) | ND(<2) |
| Lead (Pb) Content (mg/kg) | 47 |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Content (mg/kg) | ND(<1) |
| Polybrominated Biphenyls (PBBs)(mg/kg) | |
| Monobromobiphenyl (MonoBB) | ND(<5) |
| Dibromobiphenyl (DiBB) | ND(<5) |
| Tribromobiphenyl (TriBB) | ND(<5) |
| Tetrabromobiphenyl (TetraBB) | ND(<5) |
| Pentabromobiphenyl (PentaBB) | ND(<5) |
| Hexabromobiphenyl (HexaBB) | ND(<5) |
| Heptabromobiphenyl (HeptaBB) | ND(<5) |
| Octabromobiphenyl (OctaBB) | ND(<5) |
| Nonabromobiphenyl (NonaBB) | ND(<5) |
| Decabromobiphenyl (DecaBB) | ND(<5) |
| Polybrominated Diphenyl Ethers (PBDEs)(mg/kg) | |
| Monobromodiphenyl Ether (MonoBDE) | ND(<5) |
| Dibromodiphenyl Ether (DiBDE) | ND(<5) |
| Tribromodiphenyl Ether (TriBDE) | ND(<5) |
| Tetrabromodiphenyl Ether (TetraBDE) | ND(<5) |
| Pentabromodiphenyl Ether (PentaBDE) | ND(<5) |
| Hexabromodiphenyl Ether (HexaBDE) | ND(<5) |
| Heptabromodiphenyl Ether (HeptaBDE) | ND(<5) |
| Octabromodiphenyl Ether (OctaBDE) | ND(<5) |
| Nonabromodiphenyl Ether (NonaBDE) | ND(<5) |
| Decabromodiphenyl Ether (DecaBDE) | ND(<5) |

Chemist: Wang Haijun/Zeng Guoliang

mg/kg = milligram per kilogram = ppm
< = Less than
ND = Not detected

Tested components:

- (1) Red plastic (based of mark as #1).
- (2) Red plastic (lid of mark as #1).

Test Report

Number: SZHH00651966

Tests Conducted

(B) RoHS Requirement:

| Restricted Substances | Limits |
|--|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |
| Polybrominated Biphenyls (PBBs) | 0.1% (1000 mg/kg) |
| Polybrominated Diphenyl Ethers (PBDEs) | 0.1% (1000 mg/kg) |

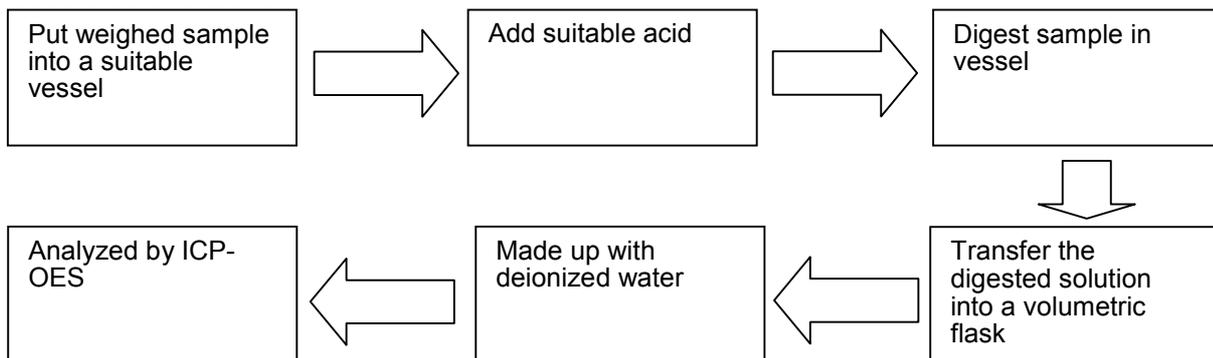
The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

(C) Test Method:

| Testing Item | Testing Method | Reporting Limit |
|---|--|-----------------|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI)(Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by alkaline digestion and determined by UV-VIS Spectrophotometer | 1 mg/kg |
| Polybrominated Biphenyls (PBBs)& Polybrominated Diphenyl Ethers (PBDEs) | With reference to IEC 62321 Edition 1.0:2008, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary | 5 mg/kg |

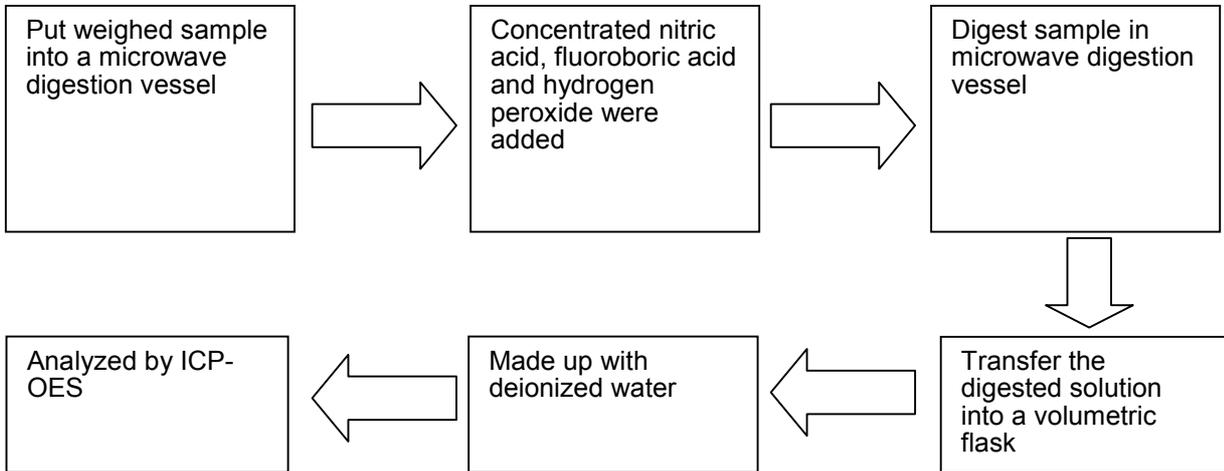
Date sample received: Dec 08, 2011
 Testing period: Dec 08, 2011 to Dec 13, 2011

(D) Measurement Flowchart:
 1. Test for Cd/Pb Contents

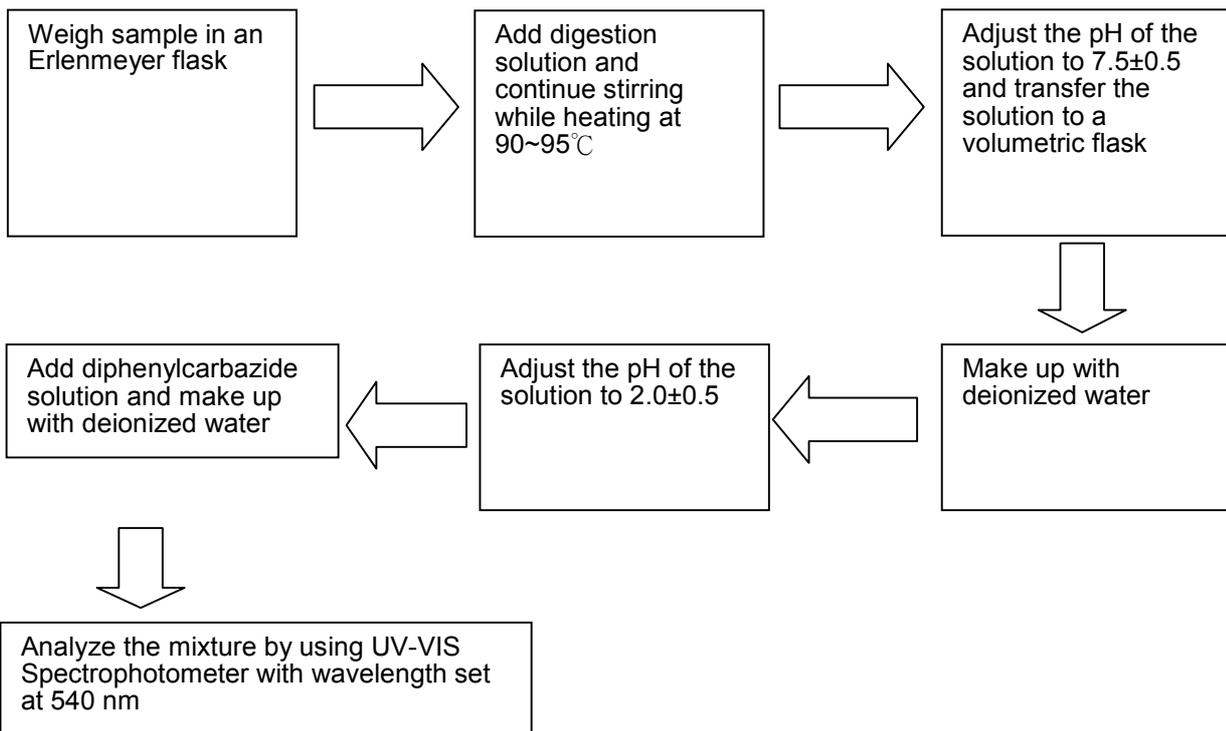


Tests Conducted

2. Test for Hg Content



3. Test for Chromium (VI) (Cr⁶⁺) Content (Alkaline Digestion)

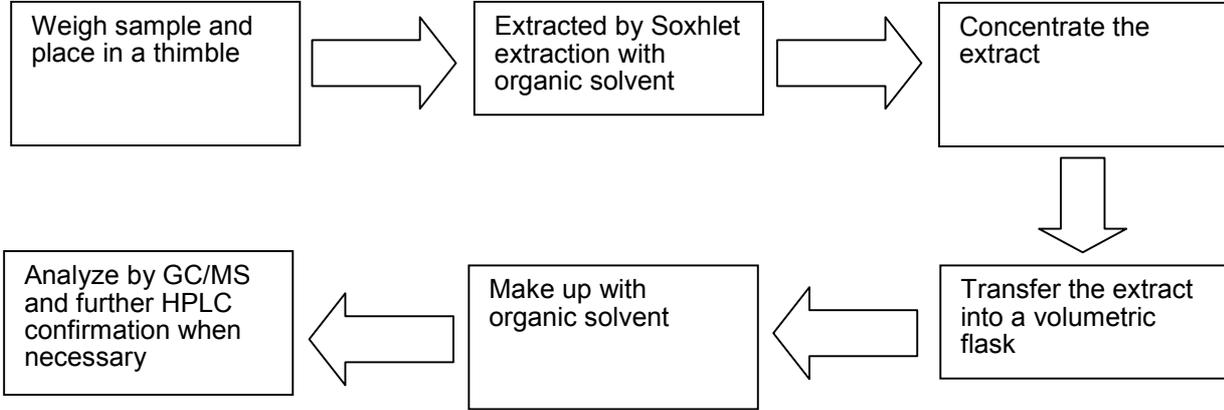


Test Report

Number: SZHH00651966

Tests Conducted

4. Test for PBBs/PBDEs Contents



2 Halogen Content

(I) Test Result Summary:

| Testing Item | Result (mg/kg) |
|-----------------------|----------------|
| | (1/2) |
| Fluorine (F) Content | 597 |
| Chlorine (Cl) Content | ND |
| Bromine (Br) Content | 41600 |
| Iodine (I) Content | ND |

mg/kg= milligram per kilogram = ppm
 ND= Not detected

Remark: As requested by the applicant, tested components (1) and (2) were tested together.

(II) Test Method:

| Testing Item | Testing Method | Reporting Limit |
|--------------------------------|---|-----------------|
| Halogen (F, Cl, Br, I) Content | With reference to BS EN 14582:2007, by calorimetric bomb and determined by Ion Chromatography | 50 mg/kg |

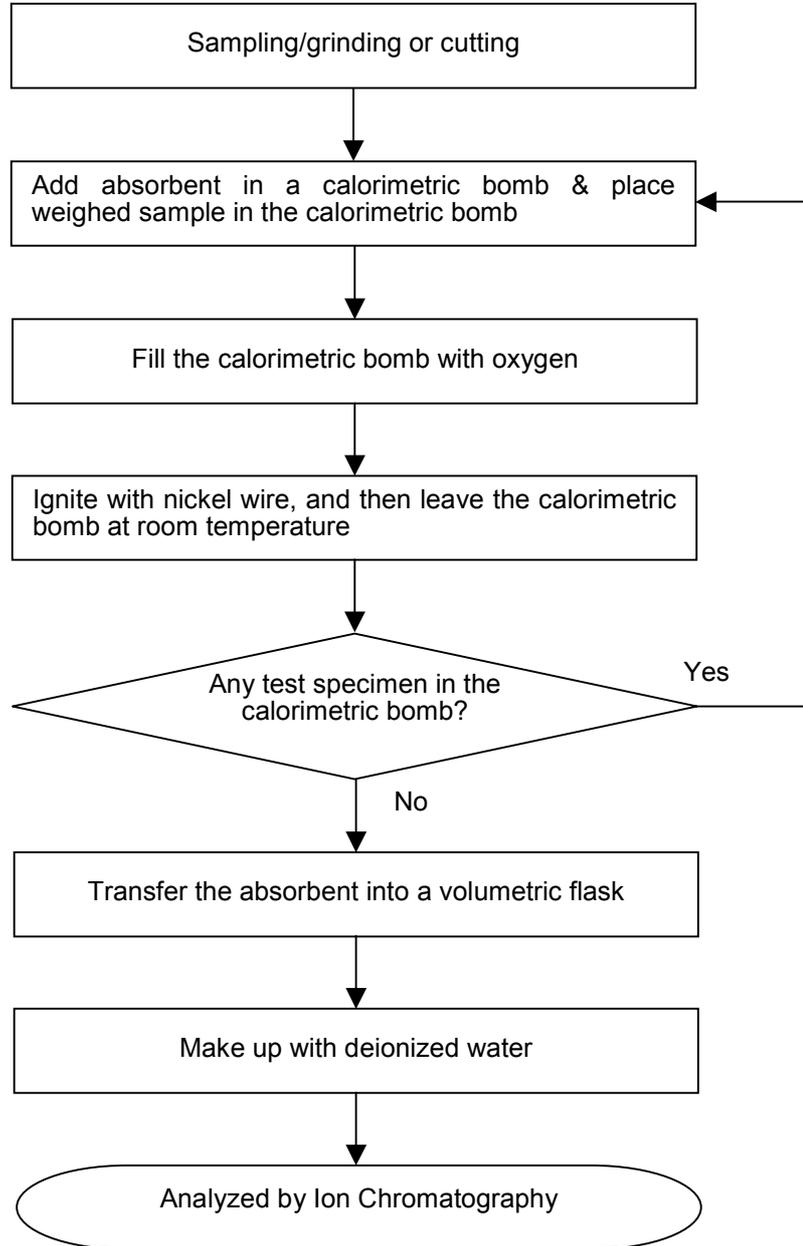
Reporting limit = Quantitation limit of analyte in sample

Date sample received: Dec 08, 2011
 Testing period: Dec 08, 2011 to Dec 14, 2011

Tests Conducted

(III) Measurement Flowchart:

Test for Halogen Content (Reference Method: BS EN 14582:2007)





Test Report

Number: SZHH00651966

Tests Conducted

3 Phthalate Content

With reference to EN14372, by Gas chromatographic-Mass Spectrometric (GC-MS) analysis.

| | <u>Result (%)</u> |
|-------------------------------------|-------------------|
| | <u>(1/2)</u> |
| Dibutyl phthalate (DBP) | <0.01 |
| Di-(2-ethyl hexyl) phthalate (DEHP) | <0.01 |
| Benzyl butyl phthalate (BBP) | <0.01 |
| Sum of three phthalates | <0.01 |
| Limit | 0.1 % |

The above limit was quoted according to Annex XVII Items 51 & 52 of the REACH Regulation (EC) No. 1907/2006 & Amendment No. 552/2009(formerly known as Directive 2005/84/EC) for phthalate content in toys and children articles.

< = Less than

As per client's request, only DBP, DEHP and BBP were tested for the components (1) to (2) of the submitted sample.

Tested components:

- (1) Red plastic (based of mark as #1).
- (2) Red plastic (lid of mark as #1).

Date sample received : Dec 08, 2011
Testing period : Dec 08, 2011 to Dec 12, 2011

4 Hexabromocyclododecane (HBCDD) Content:

By solvent extraction followed by Gas Chromatographic - Mass Spectrometric (GC-MS) analysis.

| <u>Tested Sample</u> | <u>Result (mg/kg)</u> |
|----------------------|-----------------------|
| (1/2) | <10 |

< = Less than
mg/kg =milligram per kilogram

Tested components:

- (1) Red plastic (based of mark as #1).
- (2) Red plastic (lid of mark as #1).

Date sample received: Dec 08, 2011
Testing period: Dec 08, 2011 to Dec 10, 2011

End of report



Test Report

Number: SZHH00651912

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Dec 13, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

Sample Description:

One (1) submitted sample said to be **silver color metal (aluminum fastener)**.



Tests conducted:

As requested by the applicant, refer to attached page(s) for details.

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.



Ben N.L. Lin
General Manager



Test Report

Number: SZHH00651912

Tests Conducted

RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|---|-----------------|
| Cadmium (Cd) Content (mg/kg) | ND(<2) |
| Lead (Pb) Content (mg/kg) | 3370 |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)(mg/kg with 50cm ²) | Negative(<0.02) |

Chemist: Wang Haijun

mg/kg = milligram per kilogram = ppm
 mg/kg with 50cm² = milligram per kilogram with 50 square centimetre
 < = Less than
 ND = Not detected

Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedure or 0.02 mg/kg for boiling-water-extraction procedures with a sample surface area of 50cm² used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.

Negative = A negative test result indicated above positive observation was not found at the time of testing. When the spot-test showed a negative result, the boiling-water-extraction procedure shall be used to verify the result.

(B) RoHS Requirement:

| Restricted Substances | Limits |
|-----------------------------------|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

Test Report

Number: SZHH00651912

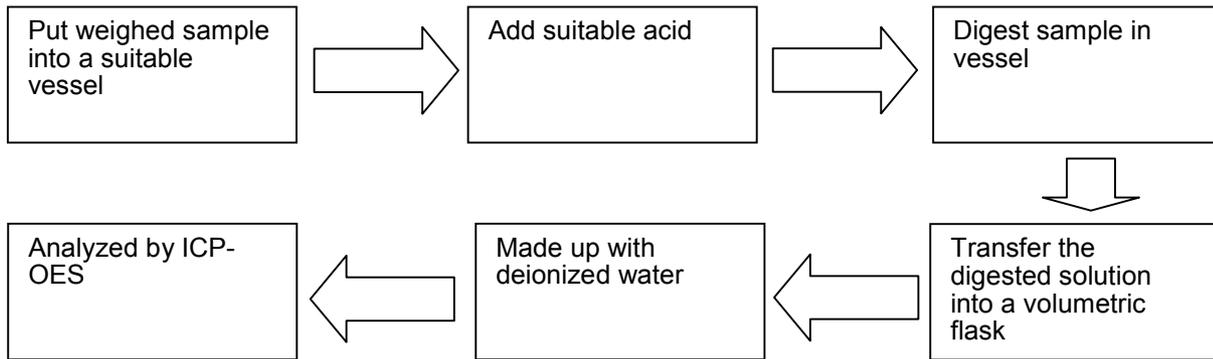
Tests Conducted

(C) Test Method:

| Testing Item | Testing Method | Reporting Limit |
|---|--|--|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI) (Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by boiling water extraction and determined by UV-VIS Spectrophotometer | Positive/Negative (Threshold of 0.02mg/kg with 50cm ²) |

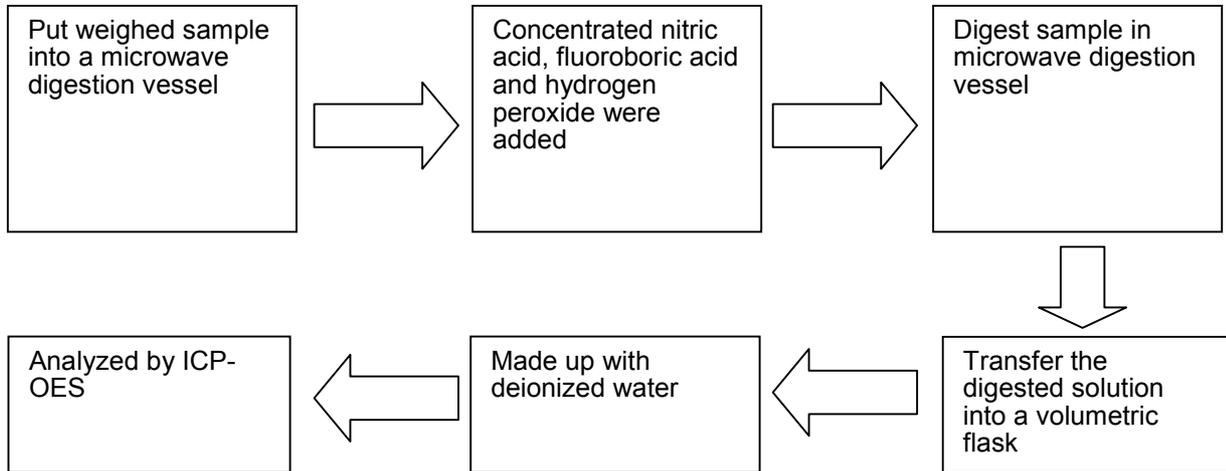
Date sample received: Dec 08, 2011
 Testing period: Dec 08, 2011 to Dec 10, 2011

(D) Measurement Flowchart:
 1. Test for Cd/Pb Contents

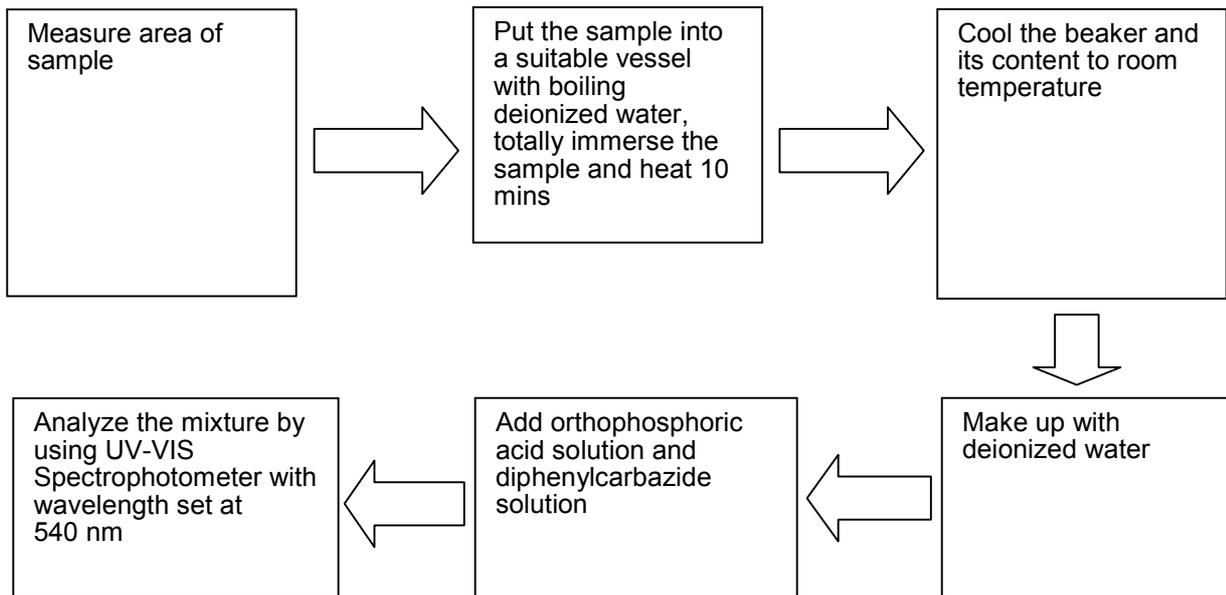


Tests Conducted

2. Test for Hg Content



3. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)



End of report



Test Report

Number: SZHH00651883

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Dec 13, 2011

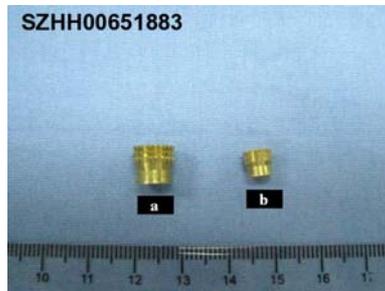
Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

Sample Description:

One (1) submitted sample said to be **copper screw**.

Tested components:

- (a) copper color metal. (big)
- (b) copper color metal. (small)



Tests conducted:

As requested by the applicant, refer to attached page(s) for details.

Remark : As requested by the applicant, tested components (a) and (b) were tested together.

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.



Ben N.L. Lin
General Manager



Test Report

Number: SZHH00651883

Tests Conducted

RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|---|------------------|
| | (a/b) |
| Cadmium (Cd) Content (mg/kg) | 35 |
| Lead (Pb) Content (mg/kg) | 27600 |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)(mg/kg with 50cm ²) | Negative (<0.02) |

Chemist: Wang Haijun

mg/kg = milligram per kilogram = ppm
mg/kg with 50cm² = milligram per kilogram with 50 square centimetre
< = Less than
ND = Not detected

Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedure or 0.02 mg/kg for boiling-water-extraction procedures with a sample surface area of 50cm² used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.

Negative = A negative test result indicated above positive observation was not found at the time of testing. When the spot-test showed a negative result, the boiling-water-extraction procedure shall be used to verify the result.

(B) RoHS Requirement:

| Restricted Substances | Limits |
|-----------------------------------|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

Test Report

Number: SZHH00651883

Tests Conducted

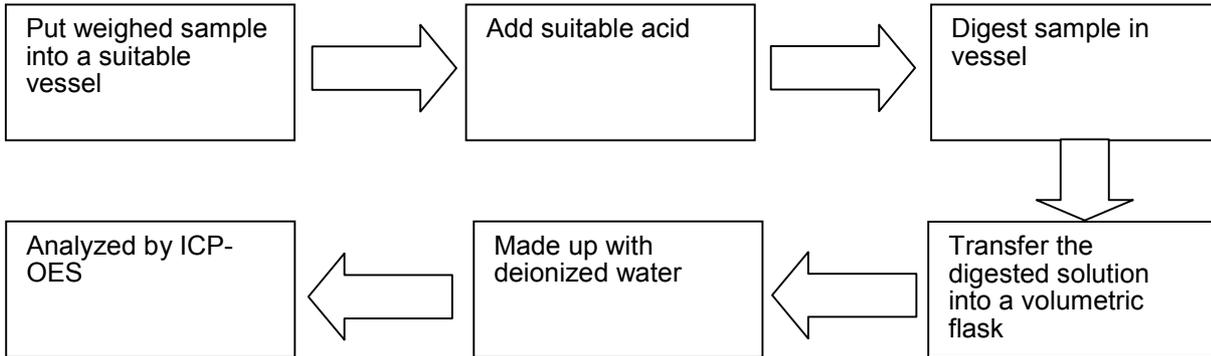
(C) Test Method:

| Testing Item | Testing Method | Reporting Limit |
|---|--|---|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI) (Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by boiling water extraction and determined by UV-VIS Spectrophotometer | Positive/Negative (Threshold of 0.02mg/kg with 50cm ²) |

Date sample received : Dec 08, 2011
 Testing period : Dec 08, 2011 to Dec 10, 2011

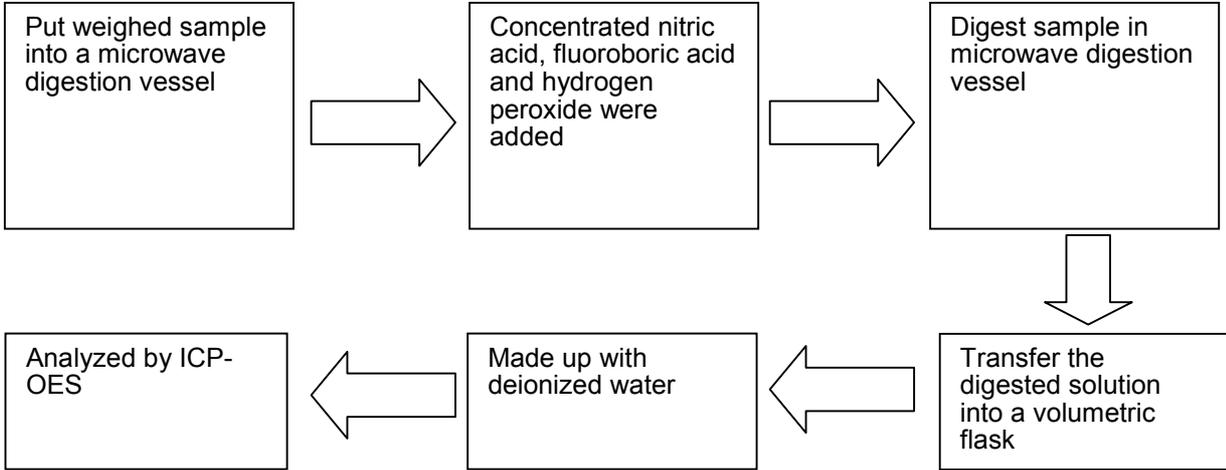
(D) Measurement Flowchart:

1. Test for Cd/Pb Contents

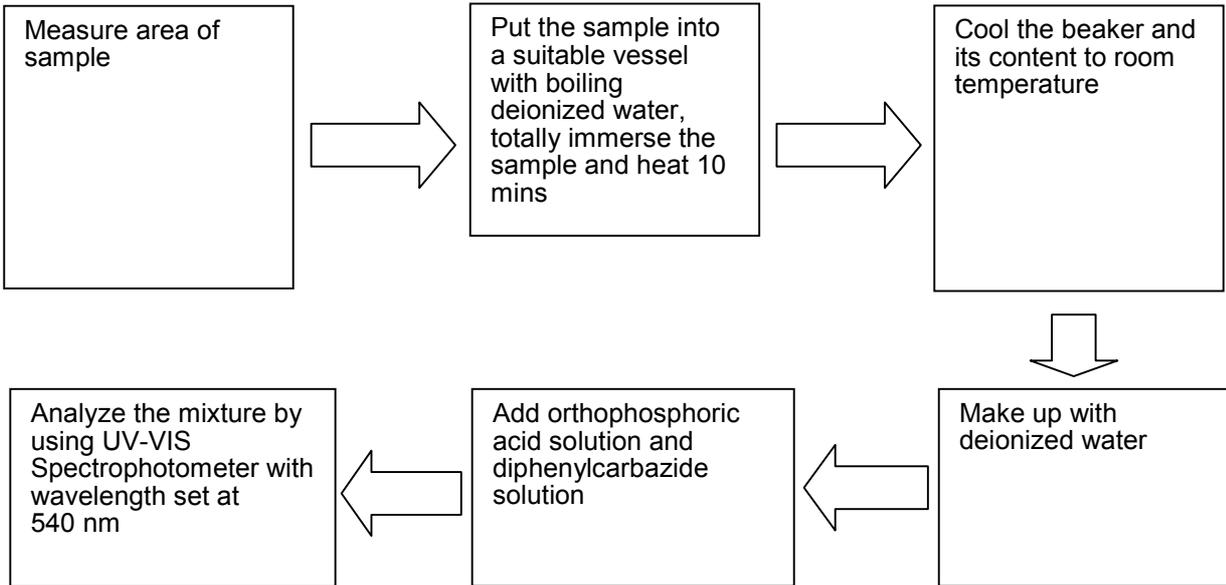


Tests Conducted

2. Test for Hg Content



3. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)



End of report

Test Report

Number: SZHH00651901

Applicant: LITTELFUSE, INC
8755 WEST HIGGINS ROAD SUITE
500CHICAGO IL 60631 USA

Date: Dec 13, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

Sample Description:

One (1) submitted sample said to be **screw & washer**.

Tested components:

- (a) silver color metal. (screw)
- (b) silver color metal. (big washer)
- (c) silver color metal. (small washer)



Tests conducted:

As requested by the applicant, refer to attached page(s) for details.

Remark: As requested by the applicant, tested components (a), (b) and (c) were tested together.

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.



Ben N.L. Lin
General Manager



Test Report

Number: SZHH00651901

Tests Conducted

RoHS Chemical Test

(A) Test Result Summary:

| Testing Item | Result |
|---|-----------------|
| | (a/b/c) |
| Cadmium (Cd) Content (mg/kg) | ND(<2) |
| Lead (Pb) Content (mg/kg) | ND(<2) |
| Mercury (Hg) Content (mg/kg) | ND(<2) |
| Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal)(mg/kg with 50cm ²) | Negative(<0.02) |

Chemist: Wang Haijun

mg/kg = milligram per kilogram = ppm
mg/kg with 50cm² = milligram per kilogram with 50 square centimetre
< = Less than
ND = Not detected

Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedure or 0.02 mg/kg for boiling-water-extraction procedures with a sample surface area of 50cm² used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.

Negative = A negative test result indicated above positive observation was not found at the time of testing. When the spot-test showed a negative result, the boiling-water-extraction procedure shall be used to verify the result.

(B) RoHS Requirement:

| Restricted Substances | Limits |
|-----------------------------------|-------------------|
| Cadmium (Cd) | 0.01% (100 mg/kg) |
| Lead (Pb) | 0.1% (1000 mg/kg) |
| Mercury (Hg) | 0.1% (1000 mg/kg) |
| Chromium (VI) (Cr ⁶⁺) | 0.1% (1000 mg/kg) |

The above limits were quoted from 2002/95/EC and amendment 2005/618/EC for homogeneous material.

Test Report

Number: SZHH00651901

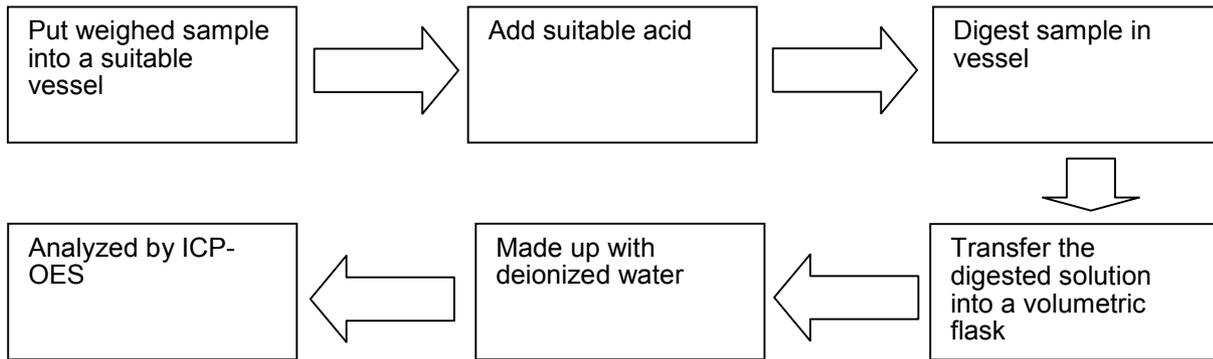
Tests Conducted

(C) Test Method:

| Testing Item | Testing Method | Reporting Limit |
|---|--|--|
| Cadmium (Cd) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Lead (Pb) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Mercury (Hg) Content | With reference to IEC 62321 Edition 1.0:2008, by acid digestion and determined by ICP - OES | 2 mg/kg |
| Chromium (VI) (Cr ⁶⁺) Content | With reference to IEC 62321 Edition 1.0:2008, by boiling water extraction and determined by UV-VIS Spectrophotometer | Positive/Negative (Threshold of 0.02mg/kg with 50cm ²) |

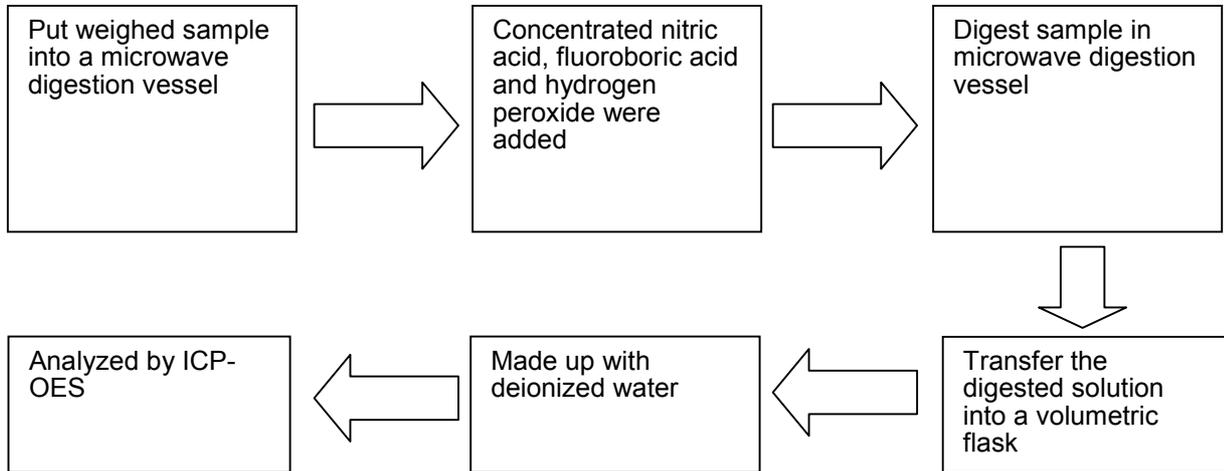
Date sample received: Dec 08, 2011
 Testing period: Dec 08, 2011 to Dec 10, 2011

(D) Measurement Flowchart:
 1. Test for Cd/Pb Contents

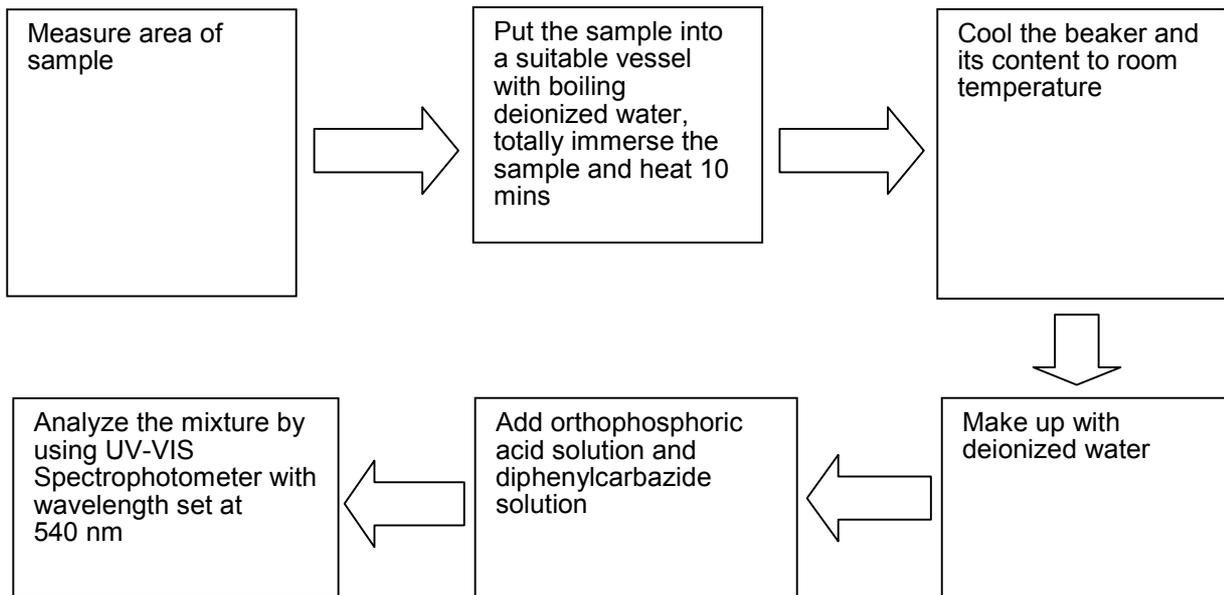


Tests Conducted

2. Test for Hg Content



3. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)



End of report