

ICP Test Report Certification Packet

Company name:	Littelfuse, Inc.	
Product Series:	5x20 Cartridge Fuse	9
Product #:	218xxxXP Series	
Issue Date:	November 12, 2013	
2011/65/EU)-restricted s packing/packaging mater In addition, it is hereby re	ubstance nor such us rials, and for additives a eported to you that the p /packaging materials, a	ere is neither RoHS (EU Directive 2002/95/EC, se, for materials to be used for unit parts, for and the like in the manufacturing processes. Dearts and sub-materials, the materials to be used and the additives and the like in the manufacturing emponents.
	Issued by: -	JORDANUFF H. CABILAN <global ehs="" engineer=""></global>
(1) Parts, sub-materials This document co Littelfuse, Inc.	•	bhs-Compliant series products manufactured by
< Raw Materials t Please see Tab		
(2) The ICP data on all Please see app	measurable substance propriate pages as iden	
Remarks :		



Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	C910541/C910510	Сар	3-6
2	C909543 (C09529)	Body – Soda Lime Glass tube	7-11
3	11-0595 (082xxx-001)	Element – Cu99.9MSn	12-15
4	082xxx	Element – Ag Plated Copper	16-20
5	687xxx-001	Element – Sn Plated Ag Cu	21-26
6	N/A	Tinned Wires	27-34
7	YTW102 (692539-002)	Solder Wire	35-40
8	3M 3779-PG (087244)	HMA – RoHS & Halogen	41-53
9	C030204	Overcap	54-57
10	934-077 (C030208)	Overcap	54-57
11	C030210	Overcap	54-57
12	648901	Ceramic Yarn	58-64
13	425901	Ink-Red	65-75
14	425902	Ink-Black	76-86
15	425903	Ink-Yellow	87-97
16	425904	Ink-Blue	98-108
17	425906	Ink-Brown	109-119
18	425907	Ink-Green	120-130
19	425909	Ink-Grey	131-141
20	425912	Ink-White	142-152
21	EP608 (087355)	HMA-Glue (Epoxy Adhesive)	153-162



NO.: A002R130403070-1R02 Date: Apr.08, 2013 Page 1 of 4

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Copper shell

Model: /

Item/Lot No.: /

Material: /
Buyer: /
Supplier: /

Manufacturer: /

Sample received date: Apr.03, 2013

Testing period: From Apr.03, 2013 to Apr.08, 2013

Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2011/65/EU (RoHS).

Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9 ICP-OES		2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

Note:

Conclusion:

When tested as specified, the submitted sample complied with the requirements of Directive 2011/65/EU (RoHS).

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

Chemical Test Director

Reviewed by: Weikin

Wang Wexin, Weikin

Technical Director

Approved by

Yuan Qi, Mickey

Lab Manager

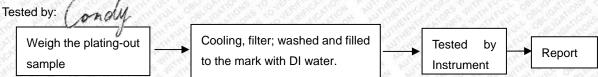


^{-* 0.02} mg/kg refers to the MQL of sample extraction liquid.



NO.: A002R130403070-1R02 Date: Apr.08, 2013 Page 2 of 4

Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: onoul Add the digestion solution; the Weigh the sample into Add H₂O₂ until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) Tested by: onoul The sample is digested in the Weigh the sample Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate) Tested by: Remove the sample, and cool Take the (50±5) cm² Heat 50 mL of DI water in the the beaker to room temperature, sample in the beaker. beaker to boiling for 10 min and do the color reaction Test the sample solution and the 0.02 Report mg/kg standard solution by UV-VIS. 4. To Determine Lead, Cadmium and Mercury Content: (Plating)

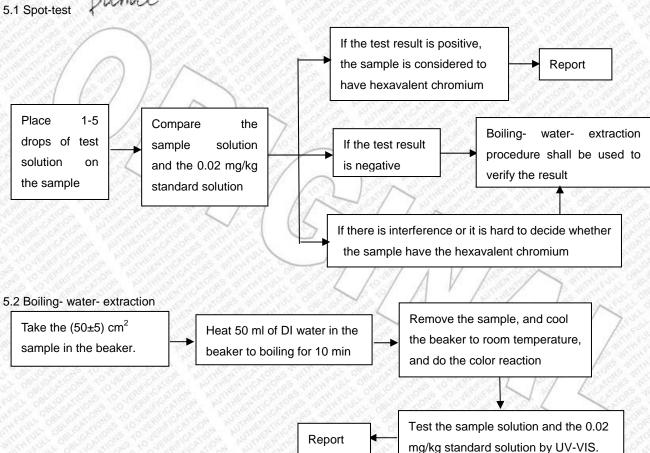






NO.: A002R130403070-1R02 Date: Apr.08, 2013 Page 3 of 4

5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating) Tested by:



Sample Description:

Code	Sample Description	
1-1	Substrate	
1-2	Plating	

Item	Unit	RoHS Limit	Results		
			1-1	1-2**	
Lead (Pb)	mg/kg	1000	12.0	N.D.	
Cadmium (Cd)	mg/kg	100	2.1	N.D.	
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	
Chromium (CrVI)	mg/kg	1000	Negative	Negative	





NO.: A002R130403070-1R02 Date: Apr.08, 2013 Page 4 of 4

Note:

- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI);

Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.

- (The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.)
- -**The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.
- -Photo is included

Photograph of Sample



Copper shell

End of Report





Test Report No. CANEC1309150301 Date: 24 Jun 2013 Page 1 of 5

XIAMEN LICHUN ELECTRONIC ELEMENT CO.,LTD
42-2 XINGLIN WEST RD,361022,JIMEI DISTRICT,XIAMEN,FUJIAN,P.R.C

The following sample(s) was/were submitted and identified on behalf of the clients as: Soda lime glass tube

SGS Job No. : XM14644726EC - XM

Date of Sample Received: 18 Jun 2013

Testing Period: 18 Jun 2013 - 24 Jun 2013

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.

Almay Gao

Approved Signatory

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and,for electronic format documents,subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of inability the appropriate to a provide the company's findings at the time of its integration of within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not excert a concare a parties to a transaction occuments. This document cannot be reproduced except in full, without prior written approval of the Company, which is an additional provided alternation, forgery or faisification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Test Report

No. CANEC1309150301

Date: 24 Jun 2013

Page 2 of 5

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 CAN13-091503.001 Transparent glass tube

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: With reference to IEC 62321:2008

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.

Limit	Unit	MDL	001
			ND
			142
	77.00		ND
			ND
1100		4	ND
		5	ND
11.0	mg/kg	5	ND
4	mg/kg	5	ND
-	mg/kg	5	ND
	mg/kg	5	ND
1.3	mg/kg	5	ND
62	mg/kg	5	ND
-	mg/kg	5	ND
1.2	mg/kg	5	ND
-	mg/kg	5	ND
1,000	mg/kg	1.5	ND
-	mg/kg	5	ND
		100 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg - mg/kg	100 mg/kg 2 1,000 mg/kg mg/kg 5 - mg/kg 5

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and/or electronic format documents,subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability transmitted in a purisdiction issues defined therein. Any holder of this document is advised that Information contained hereon reflects the Company's findings_at the time of its or expension of the company's sole responsibility is to its Client and this document does not expensive to a transaction from the properties of the company of the company. The Company is the company of the company of the company of the content or appearance of this document cannot be reproduced except in full, without prior written approval of the Company. It is a content of the content or appearance of this document is unlewful and offenders may be prosecuted to the fullest extent of the law.

196 Kezhu Road, Scientech Park Guangzhou Economic & Technology Development District, China 510663 t (86-20) 82155555 t (86-20) 82075113 www.cn.sgs.com
中国 - 广州 - 经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 i (86-20) 82075113 e sgs.china@sgs.com



Test Report	No. CANEC13091503	01	Date: 24	Jun 2013	Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>001</u>	
Dibromodiphenyl ether	2	mg/kg	5	ND	
Tribromodiphenyl ether		mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	1.2	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

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

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms and conditions for Electronic Documents at www.sgs.com/terms e-document.htm. Attention is drawn to the limitation of liability programment in the immit of the immit



Test Report

No. CANEC1309150301

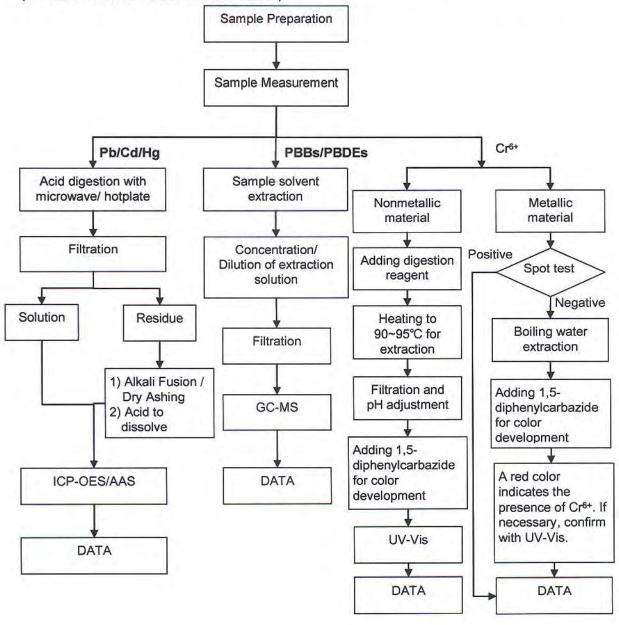
Date: 24 Jun 2013

Page 4 of 5

ATTACHMENTS

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).



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. btm and,for electronic format documents,subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms.e-document.htm. Attention is drawn to the limitation of liability in the limits of clients instructions. If any, holder of this document is advised that information contained hereon reflects the Company's findings at the time of its instruction, and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction for previous contained hereon contained hereon reflects the Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company, we unauthorized alteration, forgery or faisification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

The company is a company to the sample of the content of the sample of the content of the law.



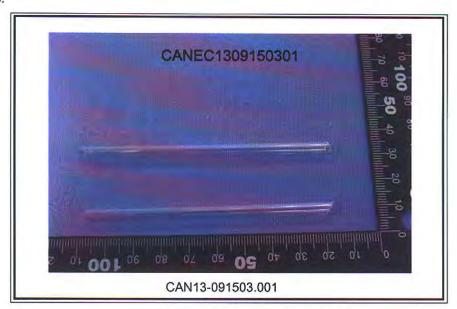
Test Report

No. CANEC1309150301

Date: 24 Jun 2013

Page 5 of 5

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. btm_and_for electronic format documents, subject to Terms_and_conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability to a mile and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its presention only about within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exponent parties to a transaction for the state of the first parties of the state of the state of the company. This document cannot be reproduced except in full, without prior written approval of the Company. This document is unlawful and offenders may be prosecuted to the fullest extent of the law.

196 Kezhu Road Scientech Part Guengzhou Economic & Technology Development District, Guengzhou China 510663 t (86-20) 82155555 t (86-20) 82075113 www.cn.sgs.com.
中国 - 广州 - 经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 t (86-20) 82075113 e sgs.china@sgs.com



Test Report SHAH00361401 Number:

Date:

JAN 16, 2013

Applicant: LITTELFUSE,INC.

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One (1) submitted sample said to be Grey Wire.

: Wire Tin Plated Cu. Item Name

Part No. Element.

Tests Conducted:

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

To be continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





Test Report SHAH00361401 Number:

Tests Conducted

(I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)	
	(1)	
Heavy Metal		
Cadmium (Cd) content	ND	
Lead (Pb) content	ND	
Mercury (Hg) content	ND	
Chromium VI (Cr ⁸⁺) content (mg/kg With 50cm ²)	Negative (< 0.02)	

<u>Testing Item</u>	Result (ppm)
	(2)
Heavy Metal	
Cadmium (Cd) content / Plating	ND
Lead (Pb) content / Plating	60
Mercury (Hg) content / Plating	ND
Chromium VI (Cr ⁶⁺) content (mg/kg With 50cm ²) / Plating	Negative (< 0.02)

Remarks:

ppm = parts per million = mg/kg

ND = not detected

@ = Due to the insufficient sample area, reduced total sample surface of 10 cm² was used and the dilution factor was adjusted accordingly.

mg/kg with 50cm² = milligram per kilogram with 50 square centimetre

Tested components:

(1)Substrate. (2)Plating.

Responsibility of Chemist: Dent Fang / Ken He

(II) RoHS Requirement:

Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ^{o+}) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing item		Reporting limit
Cadmium (Cd) content	determined by ICP-OES.	2 ppm
Lead (Pb) content	determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content		0.02 mg/kg with 50cm ²

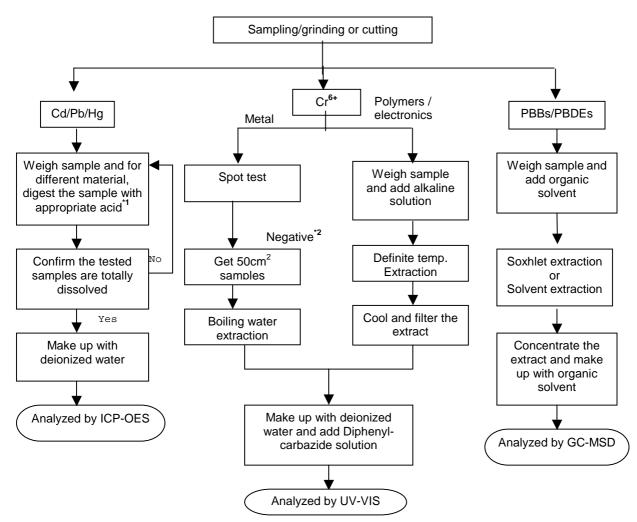
Remark: Reporting limit = Quantitation limit of analyze in sample

Date Sample Received: Jan.9, 2013
Testing Period: Jan.9, 2013 to Jan.14, 2013



Tests Conducted (IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



REMARKS:

*1: LIST OF APPROPRIATE ACID:

7 ALLINOT KIALL AGID.	
MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



Test Report SHAH00361401 Number:

Tests Conducted



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.



Applicant: ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU

GEWERBESTRASSE 87, D-98669 VEILSDORF,

GERMANY

Sample Description:

Two(2) pieces of submitted samples said to be:

(1) Mixed all kinds of metal substrates.

(2) Mixed all kinds of plating layers.

Item Name : Silver Plated & Pure Silver Wires.

Item No. : (B-1) 101.014 -. ----

- silver plated copper wire - Cu, Ag--%

(B-2) 101.0131.----

- pure silver wire - Ag 1000

(B-3) 101.0123.0---

- silver plated purest nickel wire - Ni99.98%, Ag1%

(B-4) 101.0182.0---

- silver-copper alloy plated copper plated iron nickel alloy wire

Date:

JAN 18, 2013

- ElconD, AgCu5%

(B-5) 101.0120.0---

- silver plated constantan wire - CuNi44, Ag5%

(B-6) 101.0151.0---

- silver plated copper - nickel 44 alloy wire

- CuNi44, Ag10%

(B-7) 1050--31.----

pure silver strips – Ag 1000 pure

Country Of Origin Germany.

Tests Conducted:

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

To Be Continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





Test Report SHAH0036227401 Number:

Tests Conducted

(A) Test result of RoHS Directive:

Testing item	<u>Result</u>
resung item	(1)
Cadmium (Cd) content (mg/kg)	ND
Lead (Pb) content (mg/kg)	ND
Mercury (Hg) content (mg/kg)	ND
Chromium (VI)(Cr ⁶⁺) result (by boiling water extraction on metal) (mg/kg with 50cm ²)	ND

Testing item	Result	
resung item	(2)	
Cadmium (Cd) content (mg/kg) /Plating	ND	
Lead (Pb) content (mg/kg) /Plating	ND	
Mercury (Hg) content (mg/kg) /Plating	ND	
Chromium (VI)(Cr ⁶⁺) result (by boiling water extraction on metal) (mg/kg with 50cm ²) /Plating	ND	

Remark: mg/kg with 50cm² = milligram per kilogram with 50 square centimeter

ND = not detected

(B) RoHS Requirement:

(B) Notice 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 ^{o+})	0.1% (1000 mg/kg)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(C) Test method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	determined by ICP-OES.	2 mg/kg
Lead (Pb) content	determined by ICP-OES.	2 mg/kg
Mercury (Hg) content	With reference to IEC 62321 Edition 1.0: 2008, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Chromium (VI) (Cr ⁶⁺) content (for metal)	With reference to IEC 62321 Edition 1.0: 2008, by boiling water extraction and determined by UV-VIS Spectrophotometer.	0.02mg/kg with 50cm ² (in testing solution)

Date sample received: Jan.14, 2013 Testing period: Jan.14, 2013 To Jan.17, 2013

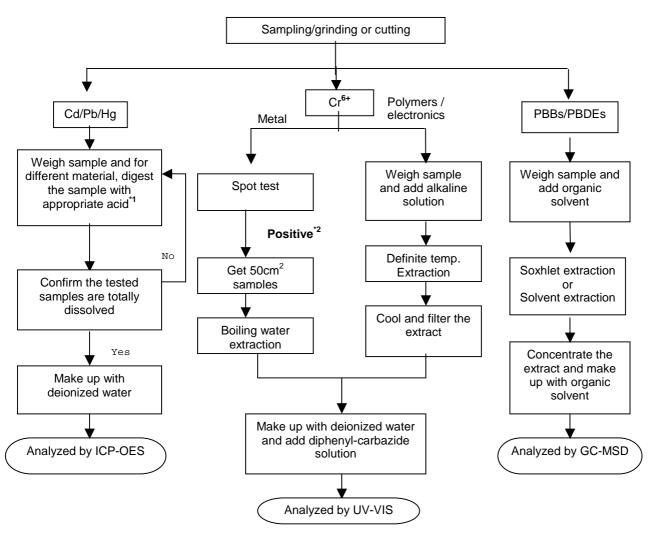
To Be Continued



Tests Conducted

(D) Measurement flowchart:

Test for Cd/Pb/Hg/Cr (VI)/PBBs/PBDEs contents Reference standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: list of appropriate acid:

	. appropriate acial			
Material Acid added for digestion				
ĺ	Polymers	HNO ₃ ,HCL,HF,H ₂ O ₂ ,H ₃ BO ₃		
	Metals	HNO ₃ ,HCL,HF		
ſ	Electronics	HNO_{3} , HCL , $H_{2}O_{2}$, HBF_{4}		

*2: If the result of spot test is positive, Chromium VI would be determined as detected.

To Be Continued





To Be Continued



Tests Conducted



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.



Applicant: LITTELFUSE,INC. Date: JAN 30, 2013

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One(1) submitted sample said to be **Grey Wire.** Item Name : Element.

Part No. : Wire Sn Plated AgCu (687279-001).

Tests Conducted:

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

To be continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





Test Report SHAH00364112 Number:

Tests Conducted

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	(1)
Cadmium (Cd) content	ND
Lead (Pb) content	10
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content (mg/kg With 50cm ²)	Negative (< 0.02)

Testing Item	Result (ppm)
Heavy Metal	(2)
Cadmium (Cd) content / Plating	ND
Lead (Pb) content / Plating	70
Mercury (Hg) content / Plating	ND
Chromium VI (Cr ⁶⁺) content (mg/kg With 50cm ²) / Plating	Negative (< 0.02)

Remarks: ppm = parts per million = mg/kg

ND = not detected

mg/kg with 50cm² = milligram per kilogram with 50 square centimetre

Negative = A negative test result indicated positive observation was not found at the time of testing.

Tested components:

- (1) Substrate.
- (2) Plating.

Responsibility of Chemist: Dent Fang / Ken He

(II) RoHS Requirement:

Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in Annex B, by boiling water extraction and determined by UV-VIS Spectrophotometer.	0.02 mg/kg with 50cm ²

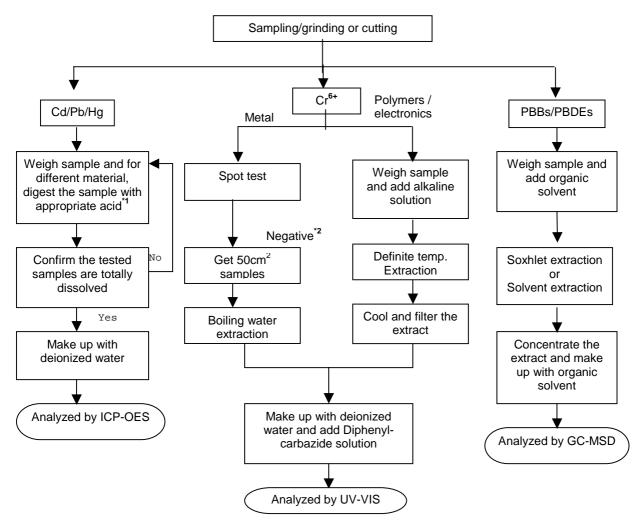
Remark: Reporting limit = Quantitation limit of analyze in sample

Date Sample Received: Jan.24, 2013 Testing Period: Jan.24, 2013 To Jan.30, 2013



Tests Conducted (IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



REMARKS:

*1: LIST OF APPROPRIATE ACID:

<u>MATERIAL</u>	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

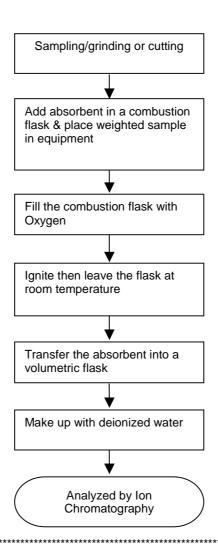
*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



Test Report SHAH00364112 Number:

Tests Conducted

(V) MEASUREMENT FLOWCHART: Test for Halogen content REFERENCE STANDARD: EN 14582





Tests Conducted





Tests Conducted



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.



Number: TWNC00296620 Test Report

Applicant: Elschukom Elektroschutzkomponentenbau

Gewerbestrasse 87, D-98669 Veilsdorf,

Germany

Sample Description:

One (1) group of submitted samples said to be :

Sample Description : Tin plated Wires

Style / Item No. :Please see page two to three.

Country of Origin :Germany Date Sample Received : Jan 23, 2013 Date Test Started :Jan 23, 2013

Test Conducted:

As requested by the applicant, for details please refer to attached pages.

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director



Date : Jan 30, 2013



Number: TWNC00296620 Test Report

```
Sample Description:
Style / Item No. : (A-1)101--271.0---
                   - tin plated copper wire - Cu, Sn--%
                   (A-2)101--283.0---
                   - tin plated, copper plated copper nickel alloy wire
                   - Elcon30, Sn--%
                   (A-3)101--272.0---
                   - tin plated, copper plated steel wire - ElconF, Sn--%
                   (A-4)101--281.0---
                   - tin plated, copper plated iron nickel alloy wire
                   - ElconD, Sn--%
                   (A-5)101--221.0---
                   - tin plated copper nickel alloy wire - CuNi44, Sn--%
                   (A-6)101--24-.0---
                   - tin plated, silver plated copper wire - Cu, Ag--%, Sn--%
                   (A-7)101--257.0---
                   - tin plated brass wire - Cu80Zn20, Sn--%
```

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Number: TWNC00296620 Test Report

```
Sample Description:
Style / Item No.
                  : (A-9)101--234.0---
                   - tin plated silver copper alloy wire
                   - AgCu90, Sn--% (ElCu90, Sn--%)
                   (A-10)101--255.----
                   - tin plated copper zinc alloy wire - Cu70Zn30, Sn--%
                   (A-11)101--229.---
                   - tin plated copper nickel alloy wire - CuNi12, Sn--%
                   (A-12)101--235.---
                   - tin plated silver copper alloy wire - Ag72Cu28, Sn--%
                   (A-13)101--231.----
                   - tin plated silver wire - Ag1000, Sn--%
                   (A-14)101--236.---
                   - tin plated silver copper alloy wire
                   - Ag45Cu55, Sn--%(AgCu55, Sn)
                   (A-15)101--266.----
                   - tin plated silver copper alloy wire
                   - AgCu70, Sn--%(ElCu70, Sn)
                   (A-16)101--238.----
                   - tin plated silver copper alloy wire
                   - AgCu80, Sn--%(Elcu80, Sn)
                   (A-17)101--228.0---
                   - tin plated tungsten wire - W, Sn
```

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Test Conducted

(I) Test Result Summary:

Test Item	<u>Unit</u>	Test Method	Result Mixed all kinds of metal wire	RL
Heavy Metal				
Cadmium (Cd) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Lead (Pb) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	37	2
Mercury (Hg) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Chromium VI (Cr ⁶⁺) content	mg/kg with 50 cm ²	With reference to IEC 62321: 2008, by boiling water extraction and determined by UV-Vis Spectrophotometer.	Negative (#)	0.02

ppm = parts per million based on weight of tested sample = mg/kg Remarks:

> = Not detected ND

= Reporting Limit, Quantitation limit of analyte in sample mg/kg with 50cm² = milligram per kilogram with 50 square centimeter

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

= Due to the insufficient sample area, reduced total sample surface of $10~{\rm cm}^2$ was used and the dilution factor was adjusted accordingly.

Responsibility of Chemist: Kevin Liu/ Irene Chiou

Date Sample Received : Jan 23, 2013

Test Period : Jan 23, 2013 To Jan 29, 2013





Test Conducted

(${\rm I\hspace{-.1em}I}$) RoHS Limits:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) content	0.01% (100ppm)
Lead (Pb) content	0.1% (1000ppm)
Mercury (Hg) content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) content	0.1% (1000ppm)

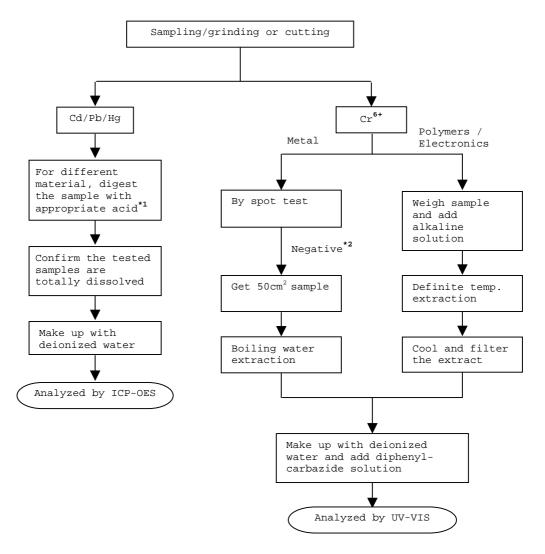
The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.





Test Conducted

Test for Cd/Pb/Hg/Chromium (VI) Reference Standard: IEC 62321 edition 1.0:2008







Test Conducted

Remarks:

*1: List of Appropriate Acid:

<u>Material</u>	Acid Added for Digestion
Polymers	HNO_3 , $HC1$, HF , H_2O_2 , H_3BO_3
Metals	HNO ₃ , HCl, HF
Electronics	HNO_3 , HCl , H_2O_2 , HBF_4

*2: If the result of spot test is positive, Chromium VI would be determined as

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 Conducted

<u>Photo</u>









Test Report No. SHAEC1317518847 Date: 06 Sep 2013 Page 1 of 6

ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as: LEAD-FREE SOLDER

WIRE

SGS Job No.: SP13-026309 - SH

Model No.: YTW102 (692539-002)

Composition : Sn2.0CuRE

Date of Sample Received : 03 Sep 2013

Testing Period: 03 Sep 2013 - 06 Sep 2013

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.

JJ Fan

Approved Signatory

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. In the conditions of Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability in terms that in an adjurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its interestition only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction for processor of this vights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. This document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In the company is a supplication of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Test Report

No. SHAEC1317518847

Date: 06 Sep 2013

Page 2 of 6

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA13-175188.040 Silvery metal wire

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 spot test / Colorimetric Method using UV-Vis.

(5) With reference to IEC 62321:2008, determination of PBBs and PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>040</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	140
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	\Diamond	Negative
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions http://www.sgs.com/terms_and_conditions of Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability integrant to an digital printed by the following states of the company of the service of the company of the service of the company of the service of the company of the company. The company of the company

haj Co.l.M 3¹¹Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国・上海・徐汇区宜山路889号3号楼 邮編: 200233

t E&E (86–21) 61402553 f E&E (86–21)64953679 HL: (86–21) 61402594 HL: (86–21)54500353



Test Report	No. SHAEC131751884	17	Date: 06	Sep 2013	Page 3 of 6
Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>040</u>	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) \$Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) 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 Cr(VI) coating

Positive = Presence of Cr(VI) 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 Cr(VI) results represent status of the sample at the time of testing.

<u>Halogen</u>

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>040</u>
Fluorine (F)	mg/kg	50	ND
Chlorine (CI)	mg/kg	50	354
Bromine (Br)	mg/kg	50	ND
lodine (I)	mg/kg	50	ND

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions http://www.sgs.com/terms_and_conditions of Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability indigental to an adjurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention onlyany within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction for processor in a distribution sunder the transaction document. This document cannot be reproduced except in full, without prior written approval of the Company. Without prior written approval of the Company unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In the company of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

hái Co.Lid 3 **Building, No. 889 Yishan Road Xuhui District, Shanghai China 200233 中国・上海・徐汇区宜山路889号3号楼 邮編: 200233 t E&E (86-21) 61402553 f E&E (86-21) 64953679 HL: (86-21) 61402594 HL: (86-21) 54500353



No. SHAEC1317518847

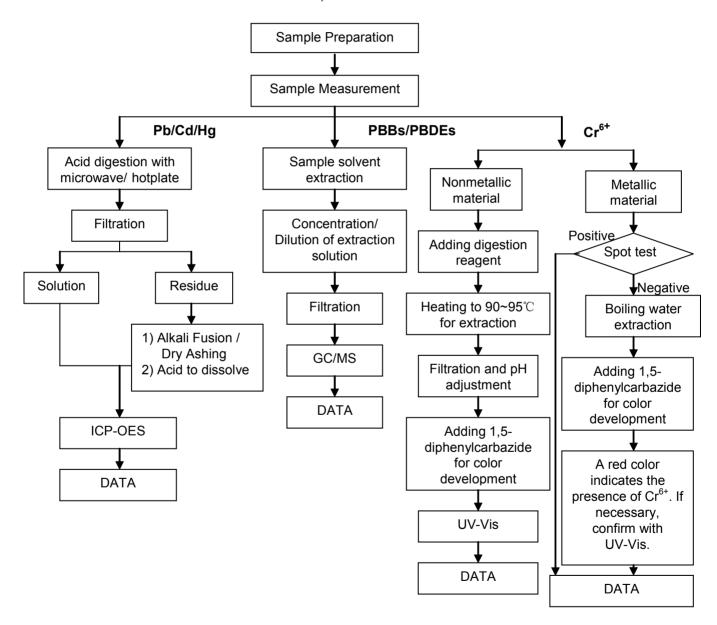
Date: 06 Sep 2013

Page 4 of 6

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions httm and for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability integers that information contained hereon reflects the Company's findings at the time of its intervention onlyang within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction for preferencising all their by hights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. It is unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In the company of the company is a stated the results shown in this test report refer only to the sample(s) tested.



No. SHAEC1317518847

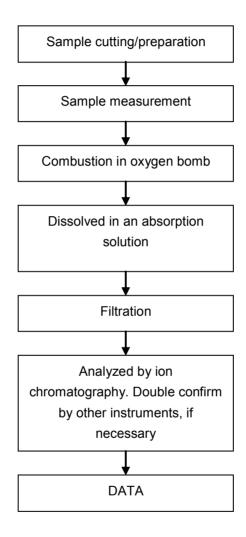
Date: 06 Sep 2013

Page 5 of 6

Halogen Testing (oxygen bomb) Flow Chart

1) Name of the person who made testing: Sisily Yin

2) Name of the person in charge of testing: Linda Li



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions http://www.sgs.com/terms_and_conditions of Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability interpretation and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its interpretation onlyany within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction for preferencising all this hyghts and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. It is unauthorized alternation, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In the company of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



No. SHAEC1317518847

Date: 06 Sep 2013

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. http://www.sgs.com/terms_and_conditions. http://www.sgs.com/terms_and_conditions. http://www.sgs.com/terms_and_conditions. http://www.sgs.com/terms_edocument.htm. Attention is drawn to the limitation of liability interpretation and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings_at the time of its jurisdiction of liability interpretation into its property into its client and this document does not exonerate parties to a transaction for property or its property into its property into its client and this document does not exonerate parties to a transaction for property into its property in full, without prior written approval of the Company.

In a supplementation of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In a supplementation of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

In a supplementation of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



No. SHAEC1219975401

Date: 19 Nov 2012

Page 1 of 7

3M CHINA LIMITED 222# TIAN LIN ROAD, SHANGHAI (200233)

The following sample(s) was/were submitted and identified on behalf of the clients as: 3M 3779-PG

SGS Job No.: SP12-033081 - SH

Date of Sample Received: 14 Nov 2012

Testing Period: 14 Nov 2012 - 19 Nov 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).

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.

JJ Fan

Approved Signatory

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability dependence of the description of the descriptio

3°Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国 · 上海 · 徐汇区宜山路889号3号楼 邮编: 200233 www.cn.sgs.com e sgs.chine@sgs.com



No. SHAEC1219975401

Date: 19 Nov 2012

Page 2 of 7

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description
1 SHA12-199754.001 Brown solid

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: 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)	<u>Limit</u>	<u>Unit</u>	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	+	ND
Monobromobiphenyl	19	mg/kg	5	ND
Dibromobiphenyl	4	mg/kg	5	ND
Tribromobiphenyl	1.4	mg/kg	5	ND
Tetrabromobiphenyl	(*)	mg/kg	5	ND
Pentabromobiphenyl		mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	0.9	mg/kg	5	ND
Octabromobiphenyl	i i	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl		mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether		mg/kg	5	ND

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. It mand, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of inability in a progression and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its interval within the limits of Client's instructions. If any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all time highest and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company for the company of the company of the company of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

The solid progression of the content or appearance of the sample(s) tested.

3"Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国 - 上海 - 徐汇区宜山路889号3号楼 邮编: 200233 www.cn.sgs.com e_sqs.china@sgs.com



Test Report	No. SHAEC12199754	01	Date: 19	Nov 2012	Page 3 of 7
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>001</u>	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether		mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether		mg/kg	5	ND	
Octabromodiphenyl ether		mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	< <u>€</u>	mg/kg	5	ND	

Notes:

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

Hexabromocyclododecane (HBCDD)

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

Test Item(s)	<u>Unit</u>	MDL	001
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.

Test Item(s)	<u>Unit</u>	MDL	001
Dibutyl Phthalate (DBP)	%	0.003	ND
Benzylbutyl Phthalate (BBP)	%	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	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.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability of several colors and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of the south of the company's findings at the time of the south of the

3°Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国・上海・徐江区宣山路889号3号楼 邮编: 200233 www.cn.sgs.com e sgs.china@sgs.com



No. SHAEC1219975401

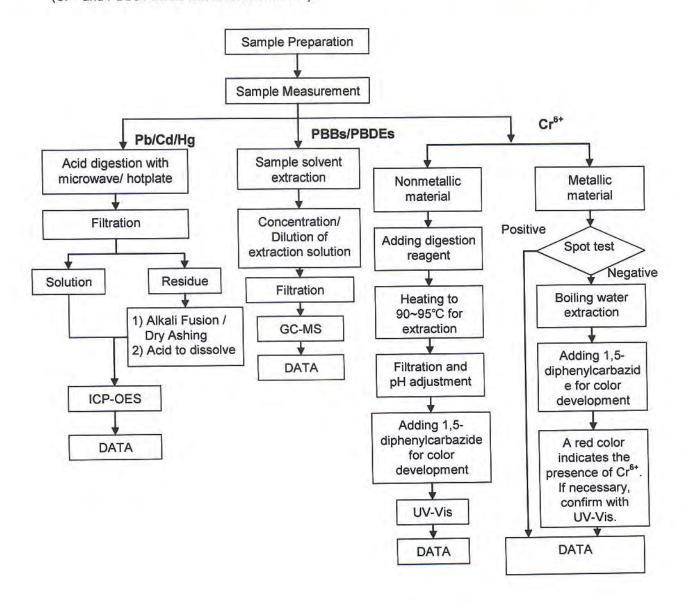
Date: 19 Nov 2012

Page 4 of 7

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of tiability and private diction issues defined theroin. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its instructions, if any. The Company's sole responsibility is to its Client and this document does not exponent parties to a transaction try dexercising all the hights and obligations under the transaction documents. This document cannot be reproduced except in full. without prior written approval of the Company. Any unauthorized siteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Lines of the prior transaction is a supplicable of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

3°Building,No.889 Yishan Road Xuhul District,Shanghai China 200233 中国 - 上海·徐汇区宜山路889号3号楼 邮编: 200233 www.cn.sgs.com e sgs.china@sgs.com



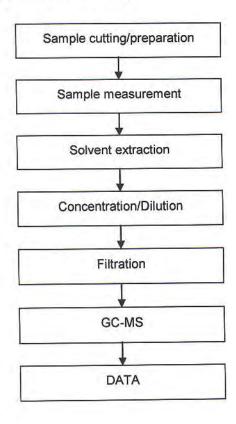
No. SHAEC1219975401

Date: 19 Nov 2012

Page 5 of 7

Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Elyn Yao
- 2) Name of the person in charge of testing: Rachel Zhang



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability in sequence of the document is advised that information contained hereon reflects the Company's findings at the time of its interesting of the company within the limits of Client's instructions. If any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from the company is all the parties of the company in the company is a sequence of the company is a sequence of the company is a sequence of the company of the company is considered its product of the company of the company is considered its product of the company of the c

3°Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国 - 上海 - 徐汇区宜山路889号3号楼 邮编: 200233 

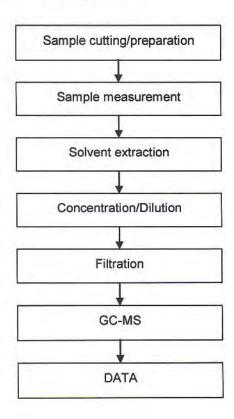
No. SHAEC1219975401

Date: 19 Nov 2012

Page 6 of 7

HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Jessy Huang



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability to account the formation contained hereon reflects the Company's findings at the time of its independent on only account the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not expense parties to a transaction for the company in the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not expense the expense of this document cannot be reproduced except in full, without prior written approval of the Company, unauthorized alternation, longery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

3°Building,No.889 Yishan Roed Xuhui District,Shanghai China 200233 中国 - 上海 · 徐汇区宜山路889号3号楼 邮编: 200233 www.cn.sgs.com e sgs.china@sgs.com



No. SHAEC1219975401

Date: 19 Nov 2012

Page 7 of 7

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terma_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of inability in formation contained hereon reflects the Company's findings at the time of its interest of the company within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exponentee parties to a transaction of the company. It is to the company in the company in the company is to the company. It is to the company in the company in the company of the Company. It is unlawful and offenders may be prosecuted to the fullest extent of the law.

If the company is to the company is to the company in the company in the company of the company is unlawful and offenders may be prosecuted to the fullest extent of the law.



No. SHAEC1219975401

Date: 19 Nov 2012

Page 1 of 6

3M CHINA LIMITED 222# TIAN LIN ROAD, SHANGHAI (200233)

The following sample(s) was/were submitted and identified on behalf of the clients as: 3M 3779-PG

SGS Job No.: SP12-033081 - SH

Date of Sample Received: 14 Nov 2012

Testing Period: 14 Nov 2012 - 19 Nov 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.

JJ Fan

Approved Signatory

spaiCand I

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm. and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of hability transportation and jurisdiction issued defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its interestion of hydrox within the limits of Client's instructions. If any, The Company's sole responsibility is to its Client and this document does not expert at a transaction its increase its produced accept in full, without prior written approval of the Company are unauthorized alternation, lorgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



No. SHAEC1219975401

Date: 19 Nov 2012

Page 2 of 6

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA12-199754.001 Brown solid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

Halogen

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	<u>Unit</u>	MDL	001
Fluorine (F)	mg/kg	50	ND
Chlorine (CI)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
lodine (I)	mg/kg	50	ND

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. It mand, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.itm. Attention is drawn to the limitation of liability in adjustment on an jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its interest within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not experted by a transaction documents. This document cannot be reproduced except in full without prior written approval of the Company, and under the transaction of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

The second of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

3 "Building, No.889 Yishan Road Xuhui District, Shanghai China 200233 中国・上海・徐江区宜山路889号3号楼 邮網: 200233 www.cn.sgs.com e sgs.china@sgs.com



No. SHAEC1219975401

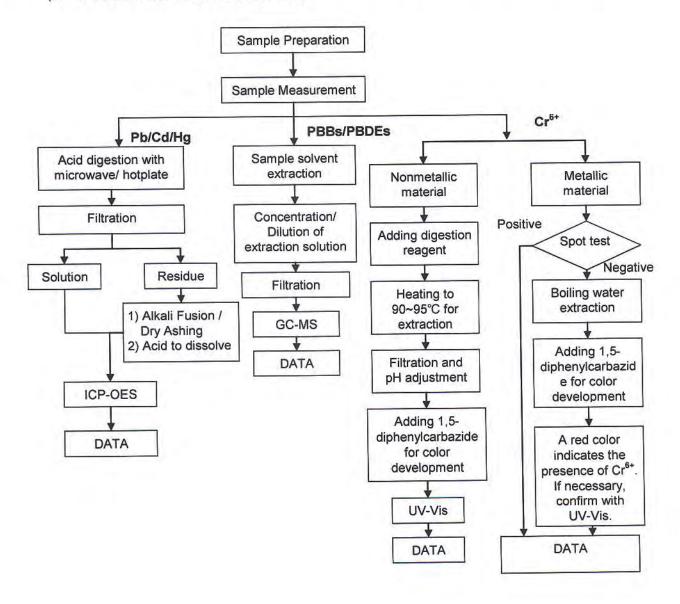
Date: 19 Nov 2012

Page 3 of 6

ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ and PBBs/PBDEs test method excluded)



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_end_conditions. htm and for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability in formation contained hereon reflects the Company's findings at the time of its persention only act, within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not expressed as a transaction of the company in the company is a sole responsibility in the limits of the company of the Company are unauthorized attention, longery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

The second of the company of the company is a supplication of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

3°Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t E&E (86-21) 61402553 f E&E (86-21)64953679 HL: (86-21) 61402594 HL: (86-21)54500353



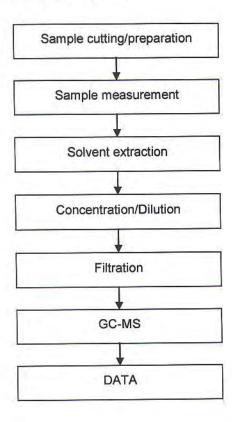
No. SHAEC1219975401

Date: 19 Nov 2012

Page 4 of 6

Phthalates Testing Flow Chart

- 1) Name of the person who made testing: Elyn Yao
- 2) Name of the person in charge of testing: Rachel Zhang



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions. htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability integritable and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its protection of liveary within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from the company is a sole in the company of the company. This document cannot be reproduced except in full, without prior written approval of the Company is unauthorized after a long to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

If the company is a long to the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



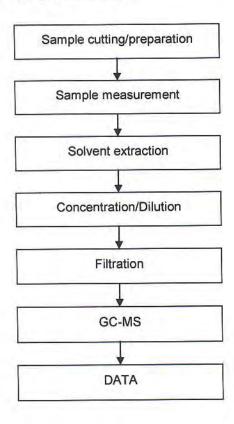
No. SHAEC1219975401

Date: 19 Nov 2012

Page 5 of 6

HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Jessy Huang



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions bitm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms-e-document.htm. Attention is drawn to the limitation of liability to grow the subject to the following state that information contained hereon reflects the Company's findings at the time of its information of ward within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exponent exported experts the company of the company of

3"Building,Na.889 Yishan Road Xuhui District,Shanghai China 200233 中国 - 上海 - 徐江区宜山路889号3号楼 鄭纲: 200233 

No. SHAEC1219975401

Date: 19 Nov 2012

Page 6 of 6

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/terms_and_conditions to reject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability and expression and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its instructions, if any. The Company's sole responsibility is to its Client and this document does not exponent parties to a transaction its ignored at the company in the company. This document cannot be reproduced except in full, without prior written approval of the Company, and unuthorized alters in a company of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

If the company is the company in this test report refer only to the sample(s) tested.

3°Building,No.889 Yishan Road Xuhui District,Shanghai China 200233 中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 www.cn.sgs.com e sgs.china@sgs.com



NO.: A002R130403070-2R02

Date: Apr.08, 2013 Page 1 of 4

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Lead wire copper shell

Model: /

Item/Lot No.: / Material:

Buyer: / Supplier:

Manufacturer: /

Sample received date: Apr.03, 2013

Testing period: From Apr.03, 2013 to Apr.08, 2013

Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2011/65/EU (RoHS).

Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

Note:

Conclusion:

When tested as specified, the submitted sample complied with the requirements of Directive 2011/65/EU (RoHS).

******FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)******

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

Chemical Test Director

Reviewed by: Weikin

Wang Wexin, Weikin

Technical Director

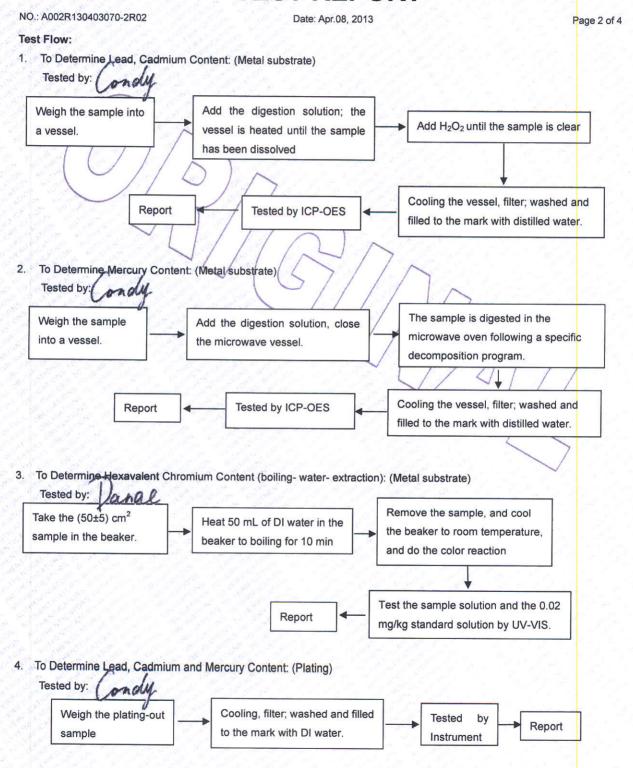
Approved by

Yuan Qi, Mickey

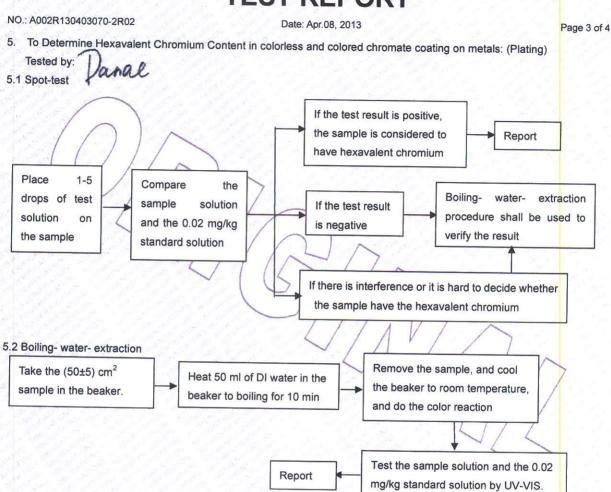
Lab Manager

^{-* 0.02} mg/kg refers to the MQL of sample extraction liquid.









Sample Description:

Code	Sample Description	Code	Sample Description
2-1	Lead wire substrate	2-3	Copper shell substrate
2-2	Lead wire Plating	2-4	Copper shell Plating

Test Results:

Item Unit		RoHS Limit	RoHS Limit			100
The state of the s	a Server	The San Court of	2-1	2-2**	2-3	2-4**
Lead (Pb)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Cadmium (Cd)	mg/kg	100	N.D.	N.D.	N.D.	N.D.
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Chromium (CrVI)	mg/kg	1000	Negative	Negative	Negative	Negative





NO.: A002R130403070-2R02

Date: Apr.08, 2013

Page 4 of 4

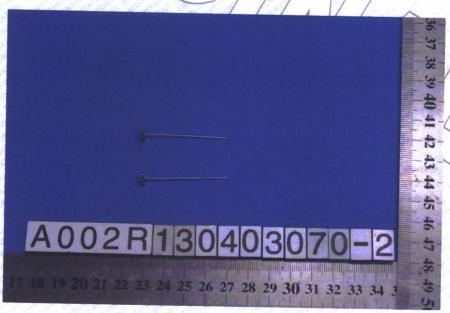
Note:

- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI);

Uncertain = can not verify whether the sample have Hexavalent Chromium by spot-test.

- (The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or
- -**The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating:
- -Photo is included

Photograph of Sample



Lead wire copper shell

End of Report





Date:

JAN 16, 2013

Applicant: LITTELFUSE,INC.

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One(1) submitted sample said to be White Yarn.

Item Name : Glass Yarn. Part No. : 648901.

Tests Conducted:

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

To Be Continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





Tests Conducted

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	·
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu

(II) RoHS Requirement:

(II) Notice Requirements	
Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.



Tests Conducted

(III) Test Method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

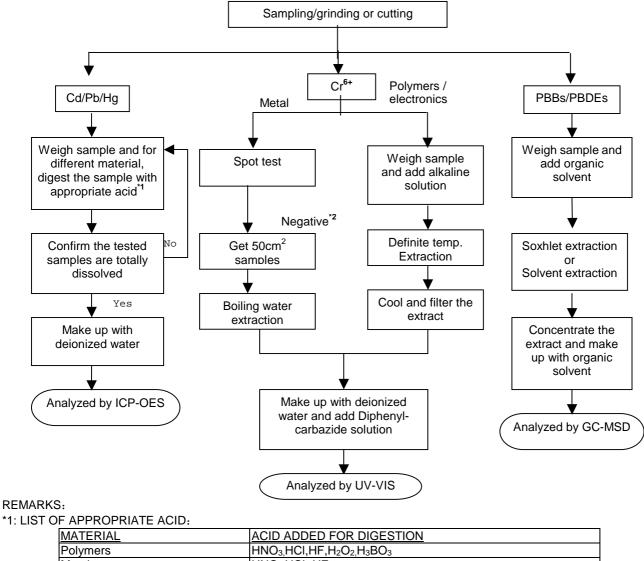
Remark: Reporting limit = Quantitation limit of analyze in sample



Tests Conducted

(IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



Tests Conducted

2 Halogen content

(I) Test result summary:

Testing item	Result (ppm)
Fluorine (F)	350
Chlorine (CI)	150
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

Responsibility of chemist: Grave Wang

(II) Test method:

Testing item	Testing method	Reporting limit
IHAINNEN CONTENT	With reference to EN 14582: 2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

Remark: Reporting limit = quantitation limit of analyte in sample

Date sample received: Jan.8, 2013

Testing period: Jan.8, 2013 To Jan.14, 2013

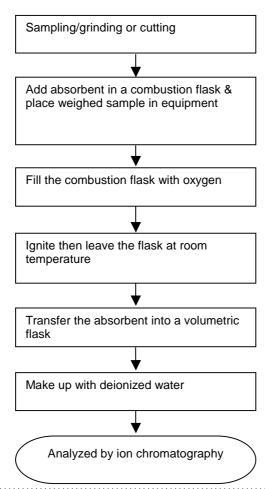


Test Report SHAH00361375 Number:

Tests Conducted

(III) MEASUREMENT FLOWCHART:

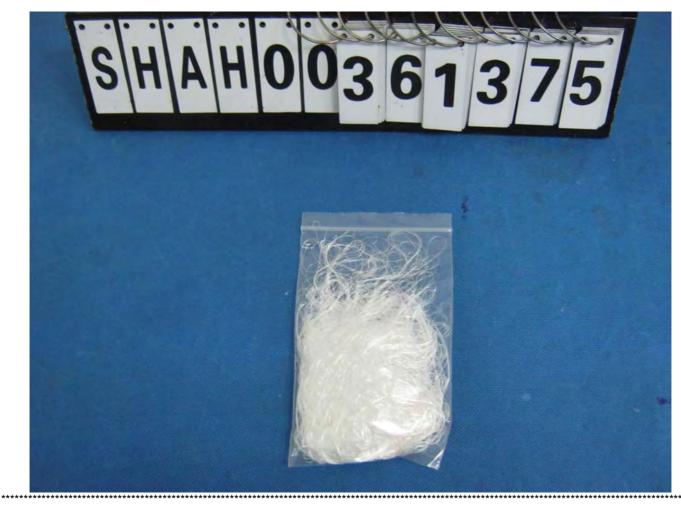
Test for halogen content REFERENCE STANDARD: EN 14582





Test Report SHAH00361375 Number:

Tests Conducted



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.



Joy Zhou

Test Report Number: 131000457SHA-007

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date	: Oct. 29, 2013
Sample Description One (1) s Part Description Part Num	ubmitted sample said to be cription	: INK	(- RED 901	******	******
Tests conducted: As reque	sted by the applicant, for	details refer to	attached page(s).	*******	*******
Conclusion: Tested sample Submitted sampl	e *********			C 62321 Edition 1.0: 2008 uoted from RoHS Directive	<u>Result</u> Pass
					To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing s	ervices Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	850
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

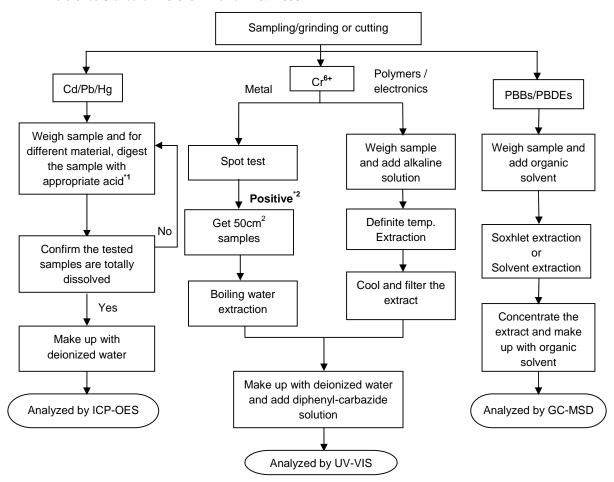
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

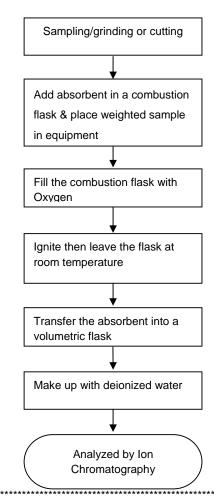
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

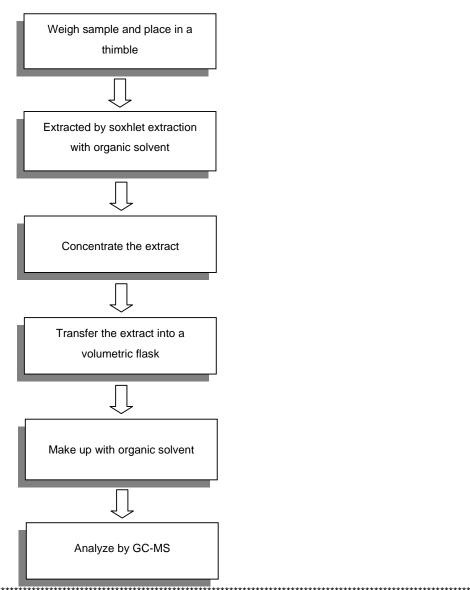
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

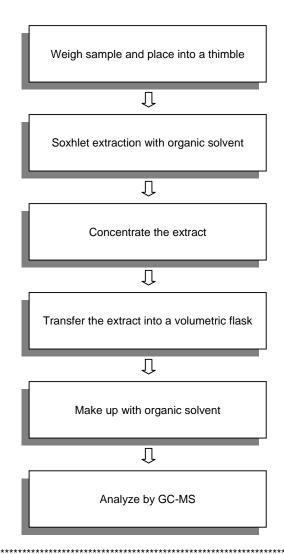
	Testing item	Testing method	Reporting limit		
	HBCDD (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm		
********	***************************************				



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Joy Zhou

Test Report Number: 131000457SHA-001

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date:	Oct. 29, 2013
Sample Description One (1) s Part Desc Part Num	ubmitted sample said to be cription	: INK	- BLACK 902	*******	*******
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	******	*******
Conclusion: Tested sample Submitted sample	Э	and maximum 2011/65/EU	e to test method of IEC 62321 n concentration limits quoted fro	om RoHS Directive	Result Pass
*******	**********	******	*************************	**********	To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing services l	_td., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	100
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

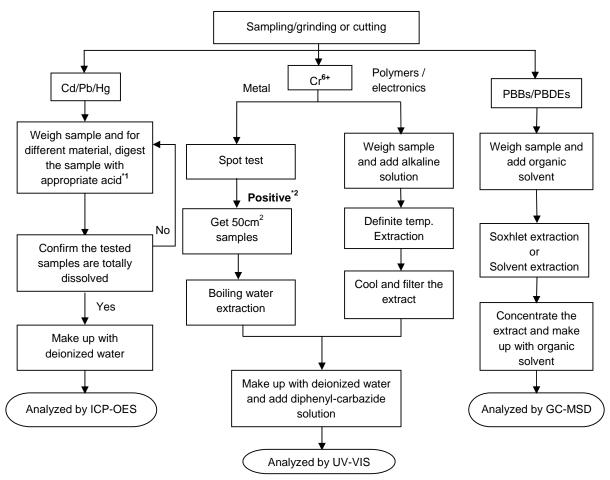
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

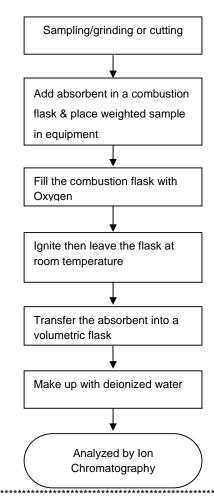
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

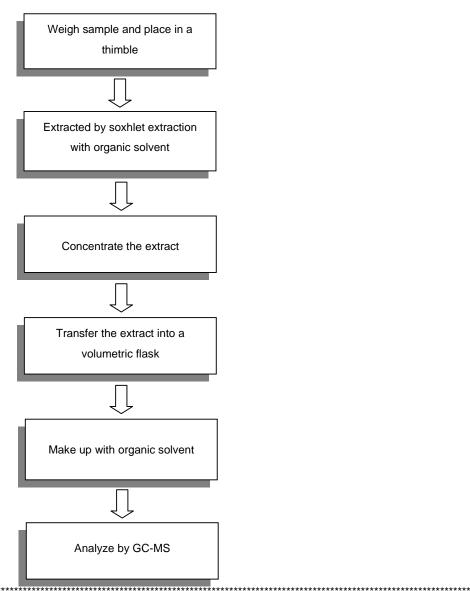
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

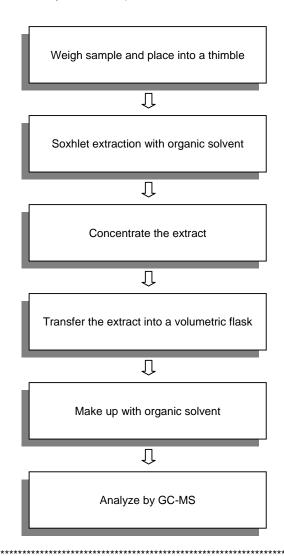
Testing item		Testing method	Reporting limit	
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm	



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013

resting period. Oct. 10, 2010 10 Oct. 23, 2010



Tests Conducted



Picture was provided by applicant

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.



Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST H DES PLAINES, IL 600 ATTN: J. CABILAN / A	16	ΓA JR	Date:	Oct. 29, 2013
Sample Description One (1) so Part Description Part Num	ubmitted sample said to b cription ber	:	w ink INK - YELLOW 425903	******	*******
Tests conducted:		-1-4-11	for to all other description		
As reques	sted by the applicant, for o	details re	erer to attached page(s).	******	******
Conclusion: Tested sample Submitted sample)		 ference to test method of IEC 62321 Edition ximum concentration limits quoted from Rol		Result Pass
**********	******************	******	*****************	*******	To be continued

Prepared and check by: For Intertek Testing Services Ltd., Shanghai Authorized by: For Intertek testing services Ltd., Shanghai Joy Zhou Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	7050
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

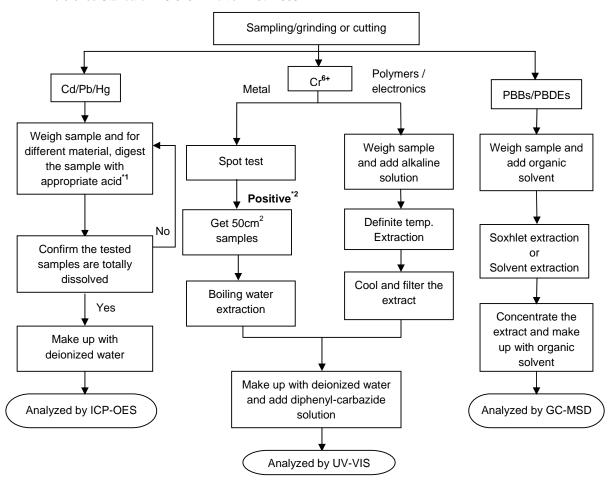
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

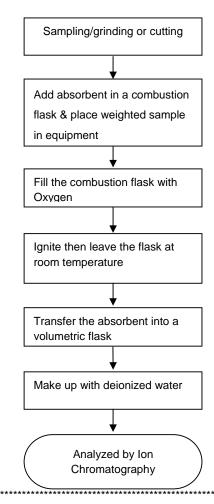
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

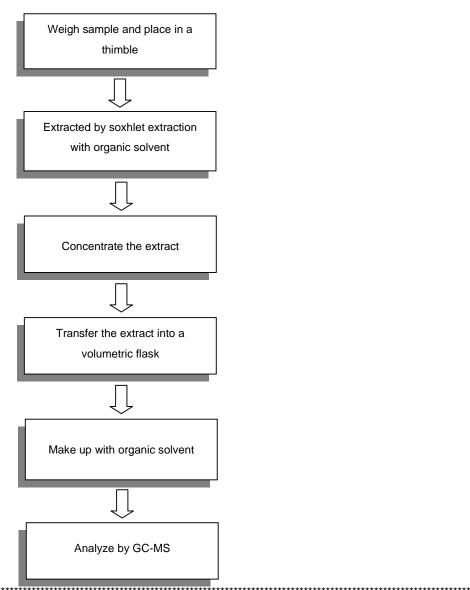
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

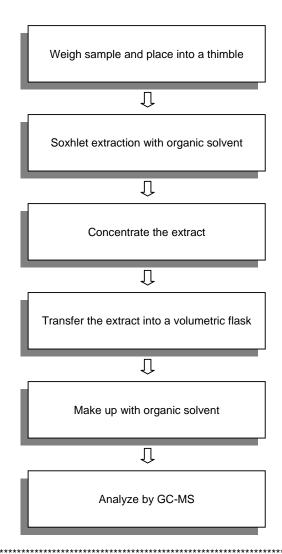
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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: 131000457SHA-002

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date:	Oct. 29, 2013
Sample Descriptio One (1) s Part Desc Part Num	ubmitted sample said to cription	: INK	BLUE 1904	*******	********
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	********	******
Conclusion: <u>Tested sample</u> Submitted sample	Э		e to test method of IEC 62 n concentration limits quote		Result Pass
*******	*******	*******	*****	*********	To be continued
Prepared and che For Intertek Testi	eck by: ng Services Ltd., Shangh	nai	Authorized by: For Intertek testing service	ees Ltd., Shanghai	
Joy Zhou			Jonny Jing Manager		



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)	
Heavy Metal		
Cadmium (Cd) content	ND	
Lead (Pb) content	ND	
Mercury (Hg) content	ND	
Chromium VI (Cr ⁶⁺) content	ND	
Polybrominated Biphenyls (PBBs)		
Monobrominated Biphenyls (MonoBB)	ND	
Dibrominated Biphenyls (DiBB)	ND	
Tribrominated Biphenyls (TriBB)	ND	
Tetrabrominated Biphenyls (TetraBB)	ND	
Pentabrominated Biphenyls (PentaBB)	ND	
Hexabrominated Biphenyls (HexaBB)	ND	
Heptabrominated Biphenyls (HeptaBB)	ND	
Octabrominated Biphenyls (OctaBB)	ND	
Nonabrominated Biphenyls (NonaBB)	ND	
Decabrominated Biphenyl (DecaBB)	ND	
Polybrominated Diphenyl Ethers (PBDEs)		
Monobrominated Diphenyl Ethers (MonoBDE)	ND	
Dibrominated Diphenyl Ethers (DiBDE)	ND	
Tribrominated Diphenyl Ethers (TriBDE)	ND	
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND	
Pentabrominated Diphenyl Ethers (PentaBDE)	ND	
Hexabrominated Diphenyl Ethers (HexaBDE)	ND	
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND	
Octabrominated Diphenyl Ethers (OctaBDE)	ND	
Nonabrominated Diphenyl Ethers (NonaBDE)	ND	
Decabrominated Diphenyl Ether (DecaBDE)	ND	
Halogen Content		
Fluorine (F)	ND	
Chlorine (CI)	300	
Bromine (Br)	ND	
lodine (I)	ND	

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

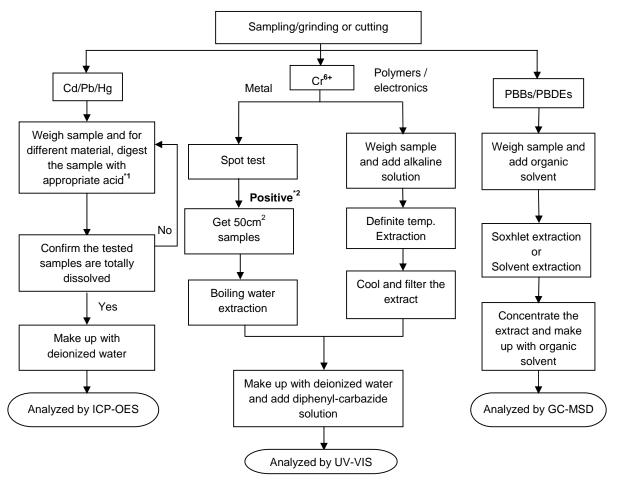
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

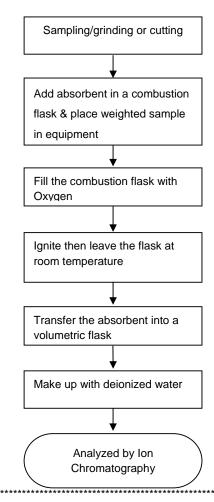
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

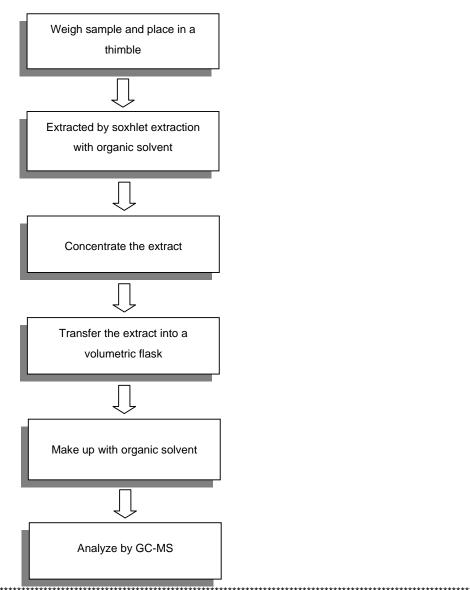
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

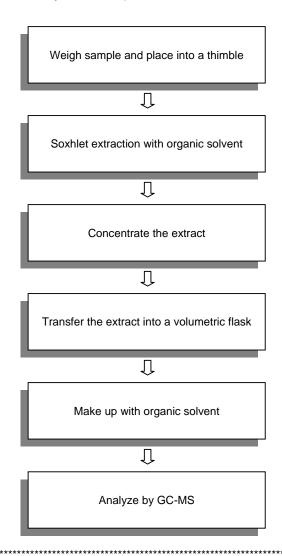
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Prepared and check by: For Intertek Testing Services Ltd., Shanghai

Joy Zhou

Test Report Number: 131000457SHA-003

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	HWY 16	: Oct. 29, 2013
Part Desc Part Num ************************************	ubmitted sample said to loription uber uber	be: Brown ink : INK - BROWN : 425906 details refer to attached page(s).	******
Conclusion: Tested sample Submitted sample	***********	Standard With reference to test method of IEC 62321 Edition 1.0: 2008 and maximum concentration limits quoted from RoHS Directive 2011/65/EU	**************************************
*******	***************************************	***************************************	To be continued

Authorized by:

Jonny Jing Manager

For Intertek testing services Ltd., Shanghai



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	·
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	9800
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

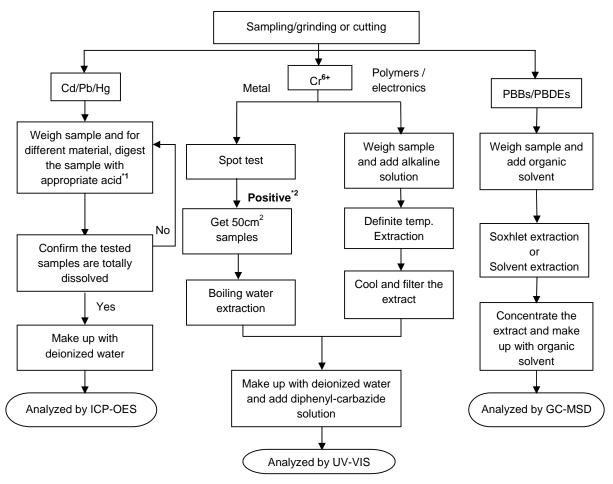
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

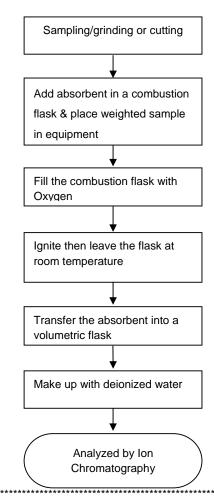
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

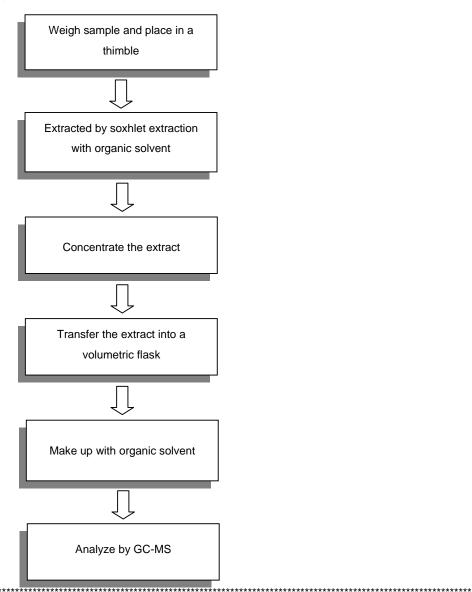
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

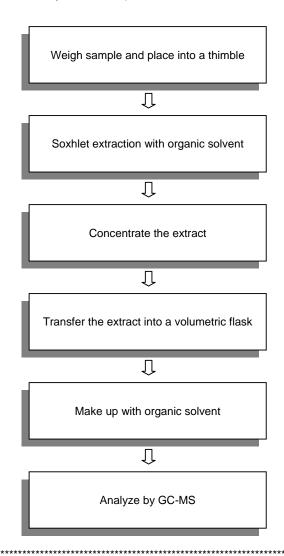
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Joy Zhou

Test Report Number: 131000457SHA-004

Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date	Oct. 29, 2013
Sample Descriptio One (1) s Part Desc Part Num	submitted sample said to be cription	: INK	(- GREEN 1907	***********	*****
Tests conducted: As reque	sted by the applicant, for	details refer to	attached page(s).	*******	*******
Conclusion: <u>Tested sample</u> Submitted sampl		and maximur 2011/65/EU	ee to test method of IEC 62 n concentration limits quote	ed from RoHS Directive	Result Pass
***********	*********	******	***********	**********	To be continued
Prepared and che For Intertek Testi	eck by: ing Services Ltd., Shangh	ai	Authorized by: For Intertek testing service	ces Ltd., Shanghai	

Jonny Jing Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr ⁶⁺) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	·
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	700
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

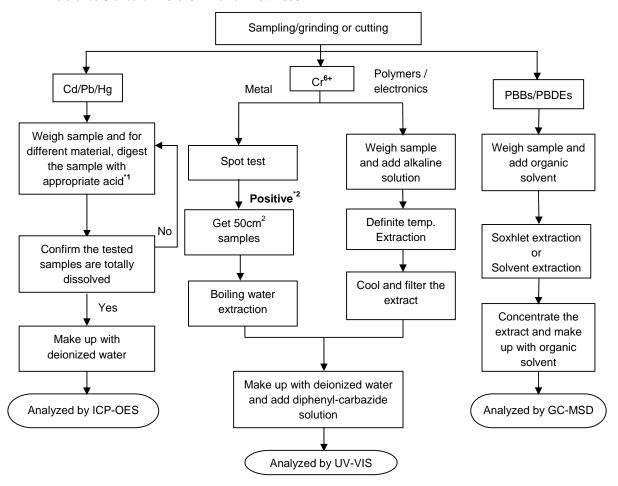
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

-11	
MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCl,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO ₃ ,HCL,HF
Electronics	HNO ₃ ,HCL,H ₂ O ₂ ,HBF ₄

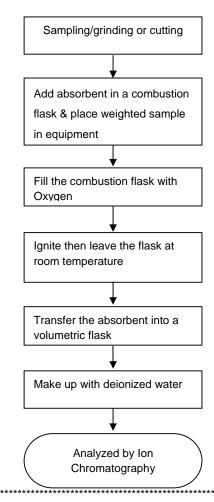
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

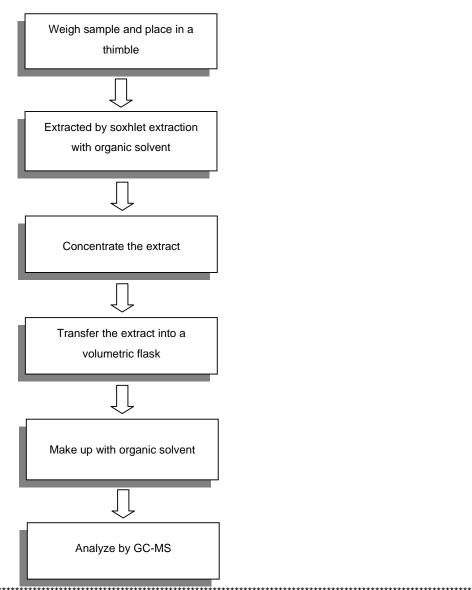
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

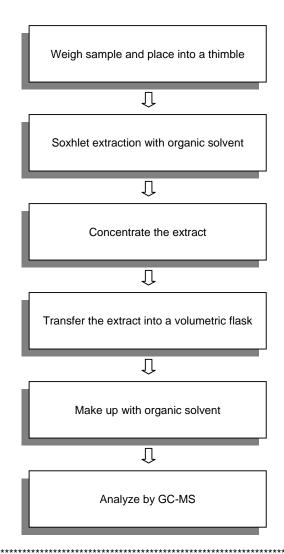
	Testing item	Testing method	Reporting limit
	HBCDD (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Da	ate: Oct. 29, 2013
Sample Description One (1) su Part Desc Part Num	ubmitted sample said to l cription		- GREY 909 **********************************	**********	********
Tests conducted: As reques	sted by the applicant, for	details refer to	attached page(s).	********	*****
Conclusion: Tested sample Submitted sample	•	and maximum 2011/65/EU	e to test method of IEC 62 n concentration limits quote	ed from RoHS Directiv	re
*******	*********	******	**********	**********	To be continued
Prepared and che For Intertek Testir	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing servi	ices Ltd., Shanghai	
Joy Zhou			Jonny Jing		

Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)			
Heavy Metal				
Cadmium (Cd) content	ND			
Lead (Pb) content	ND			
Mercury (Hg) content	ND			
Chromium VI (Cr ⁶⁺) content	ND			
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ND			
Dibrominated Biphenyls (DiBB)	ND			
Tribrominated Biphenyls (TriBB)	ND			
Tetrabrominated Biphenyls (TetraBB)	ND			
Pentabrominated Biphenyls (PentaBB)	ND			
Hexabrominated Biphenyls (HexaBB)	ND			
Heptabrominated Biphenyls (HeptaBB)	ND			
Octabrominated Biphenyls (OctaBB)	ND			
Nonabrominated Biphenyls (NonaBB)	ND			
Decabrominated Biphenyl (DecaBB)	ND			
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ND			
Dibrominated Diphenyl Ethers (DiBDE)	ND			
Tribrominated Diphenyl Ethers (TriBDE)	ND			
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND			
Pentabrominated Diphenyl Ethers (PentaBDE)	ND			
Hexabrominated Diphenyl Ethers (HexaBDE)	ND			
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND			
Octabrominated Diphenyl Ethers (OctaBDE)	ND			
Nonabrominated Diphenyl Ethers (NonaBDE)	ND			
Decabrominated Diphenyl Ether (DecaBDE)	ND			
Halogen Content				
Fluorine (F)	ND			
Chlorine (CI)	ND			
Bromine (Br)	ND			
lodine (I)	ND			

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

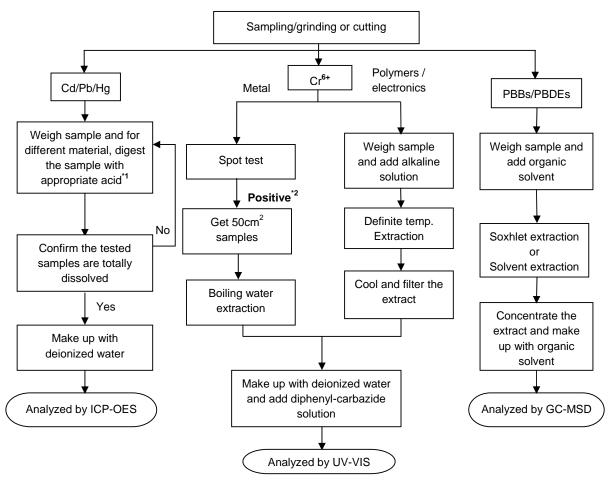
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

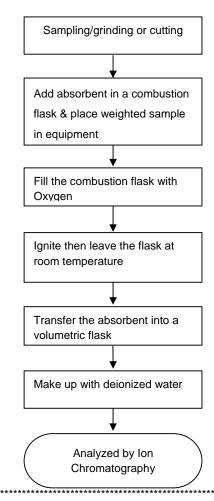
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

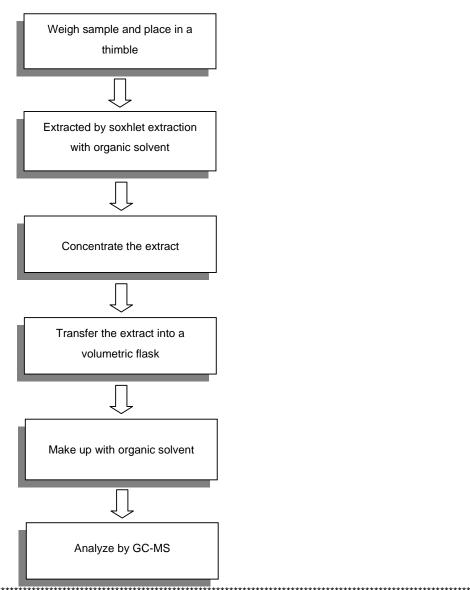
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

Testing item	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(II) Test method:

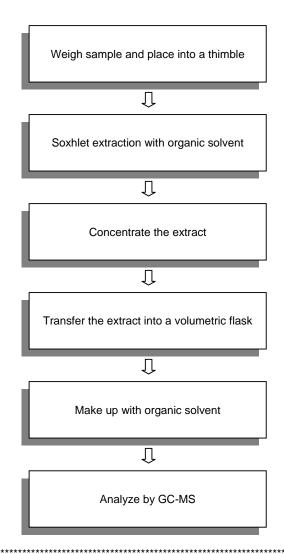
Testing item		Testing method	Reporting limit
HBCDD (hexabrom	locyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Applicant:	LITTELFUSE, INC. 800 E. NORTHWEST I DES PLAINES, IL 600 ATTN: J. CABILAN / A	16		Date:	Oct. 29, 2013
Part Desc Part Num	ubmitted sample said to b ription ber		WHITE 12 ***********************************	*******	******
Tests conducted: As reques	ted by the applicant, for	details refer to a	ttached page(s).	*******	*******
Conclusion: Tested sample Submitted sample	•		to test method of IEC 62 concentration limits quote		<u>Result</u> Pass
*******	********	******	*******	******	To be continued
Prepared and che For Intertek Testir	eck by: ng Services Ltd., Shangh	ai	Authorized by: For Intertek testing servio	ces Ltd., Shanghai	
Joy Zhou			Jonny Jing		

Manager



Tests Conducted

RoHS testing and Halogen content

(I) Test Result Summary:

Testing Item	Result (ppm)			
Heavy Metal				
Cadmium (Cd) content	ND			
Lead (Pb) content	ND			
Mercury (Hg) content	ND			
Chromium VI (Cr ⁶⁺) content	ND			
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ND			
Dibrominated Biphenyls (DiBB)	ND			
Tribrominated Biphenyls (TriBB)	ND			
Tetrabrominated Biphenyls (TetraBB)	ND			
Pentabrominated Biphenyls (PentaBB)	ND			
Hexabrominated Biphenyls (HexaBB)	ND			
Heptabrominated Biphenyls (HeptaBB)	ND			
Octabrominated Biphenyls (OctaBB)	ND			
Nonabrominated Biphenyls (NonaBB)	ND			
Decabrominated Biphenyl (DecaBB)	ND			
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ND			
Dibrominated Diphenyl Ethers (DiBDE)	ND			
Tribrominated Diphenyl Ethers (TriBDE)	ND			
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND			
Pentabrominated Diphenyl Ethers (PentaBDE)	ND			
Hexabrominated Diphenyl Ethers (HexaBDE)	ND			
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND			
Octabrominated Diphenyl Ethers (OctaBDE)	ND			
Nonabrominated Diphenyl Ethers (NonaBDE)	ND			
Decabrominated Diphenyl Ether (DecaBDE)	ND			
Halogen Content				
Fluorine (F)	ND			
Chlorine (CI)	100			
Bromine (Br)	ND			
lodine (I)	ND			

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu



Tests Conducted

(II) RoHS Requirement:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr ⁶⁺) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(III) Test Method:

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr ⁶⁺) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

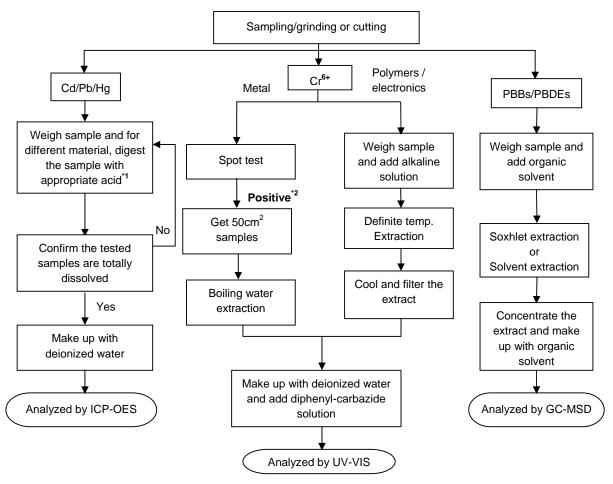
Remark: Reporting limit = Quantitation Limit of Analyze in Sample



Tests Conducted

(IV) Measurement Flowchart:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents Reference Standard: IEC 62321 Edition 1.0: 2008



Remarks:

*1: List of appropriate acid:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO ₃ ,HCI,HF,H ₂ O ₂ ,H ₃ BO ₃
Metals	HNO _{3,} HCL,HF
Electronics	HNO _{3,} HCL,H ₂ O _{2,} HBF ₄

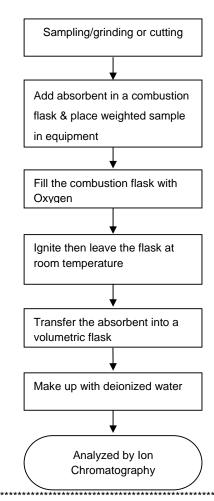
*2: If the result of spot test is positive, Chromium (VI) would be determined as detected.



Tests Conducted

(V) Measurement flowchart:

Test or Halogen content Reference standard: EN 14582





Tests Conducted

2. Phthalate content test

With reference to EN 14372 by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested Compound	Result (%,w/w)	Client' requirement (%, w/w)
Di-butyl phthalate (DBP)	ND	-
Di(2-ethyl hexyl) phthalate(DEHP)	ND	-
Benzyl butyl phthalate (BBP)	ND	-
Sum of three phthalates	ND	0.1
Di-iso-butyl phthalate (DIBP)	ND	0.1

Remark : Detection Limit = 0.01%(w/w)

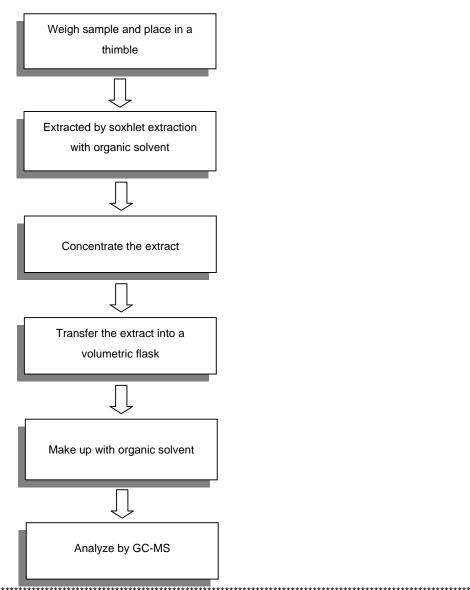
ND = Not Detected



Tests Conducted

Measurement flowchart:

Test for **phthalate** content





Tests Conducted

3. HBCDD content

(I)Test result summary:

<u>Testing item</u>	Result (ppm)
HBCDD (hexabromocyclododecane)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

(${\rm II}$) Test method:

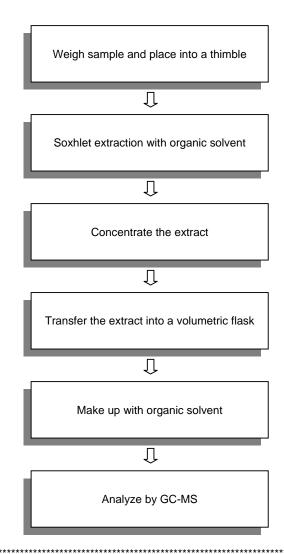
	Testing item	Testing method	Reporting limit
	HBCDD (hexabromocyclododecane)	With reference to US EPA 3540C, by solvent extraction and determined by GC-MS	10 ppm
********	****************	*****************	*******



Tests Conducted

Measurement flowchart:

Test for HBCDD (hexabromocyclododecane) content





Tests Conducted

4. Total Antimony (Sb) Content

As per client's request, acid digestion method was used and total Antimony content was determined by Inductively Coupled Argon Plasma Spectrometry.

Result: <10ppm

Remark: ppm = parts per million = mg/kg

Date sample received: Oct. 16, 2013

Testing period: Oct. 16, 2013 To Oct. 29, 2013



Tests Conducted



Picture was provided by applicant

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.



Report No. RLTJF000099660001

Page 1 of 4

BEIJING HYSTIC NEW MATERIALS CO., LTD

Address

7 ZH5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING. 100041,

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

Sample Name

EPOXY ADHESIVE

Part No.

3162

Item/Lot No.

EP625, EP652, EP425, EP162, EP162L, EP209, EP210, EP211, EP229,

EP313, EP315, EP100-EP199, EP200-EP299, EP300-EP399,

EP400-EP499, EP500-EP599, EP600-EP699

Sample Received Date

Mar. 22, 2013

Testing Period

Mar. 22, 2013 to Mar. 26, 2013

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

Test Result(s)

Please refer to the following page(s).

Reviewed by

Allen Wang

Mar. 26, 2013

Technical Manager

No. 1428642654

Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000099660001

Page 2 of 4

Test Result(s)

Tested Item(s)	Result
Lead(Pb)	N.D.
Cadmium(Cd)	N.D.
Mercury(Hg)	N.D.
Hexavalent Chromium(Cr(VI))	N.D.

Tested Item(s)	Result
Polybrominated Biphenyls(PBBs)	
Monobromobiphenyl	N.D.
Dibromobiphenyl	N.D.
Tribromobiphenyl	N.D.
Tetrabromobiphenyl	N.D.
Pentabromobiphenyl	N.D.
Hexabromobiphenyl	N.D.
Heptabromobiphenyl	N.D.
Octabromobiphenyl	N.D.
Nonabromobiphenyl	N.D.
Decabromobiphenyl	N.D.

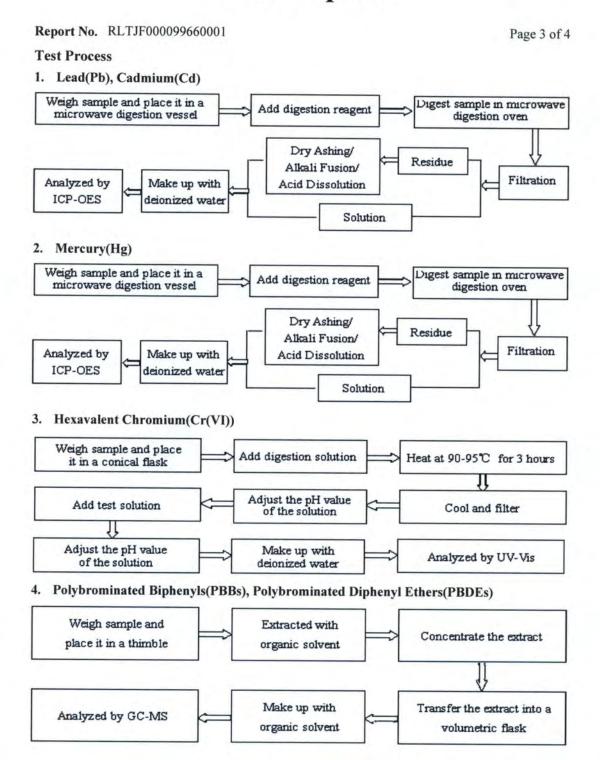
Tested Item(s)	Result
Polybrominated Diphenyl Ethers(PBDEs)	
Monobromodiphenyl ether	N.D.
Dibromodiphenyl ether	N.D.
Tribromodiphenyl ether	N.D.
Tetrabromodiphenyl ether	N.D.
Pentabromodiphenyl ether	N.D.
Hexabromodiphenyl ether	N.D.
Heptabromodiphenyl ether	N.D.
Octabromodiphenyl ether	N.D.
Nonabromodiphenyl ether	N.D.
Decabromodiphenyl ether	N.D.

Tested Sample/Part Description Bluck glue

The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury. Note:

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







Report No. RLTJF000099660001

Page 4 of 4

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.



Report No. RLTJF000102620002

Page 1 of 3

Applicant

BEIJING HYSTIC NEW MATERIALS CO., LTD.

Address

5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING. 100041,

CHINA.

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

Sample Name

EPOXY ADHESIVE

Part No.

EP608

Customer Reference

EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313,

Information

EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499,

EP500-EP599,EP600-EP699

Sample Received Date

Apr. 19, 2013

Testing Period

Apr. 19, 2013 to Apr. 24, 2013

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)
Fluorine(F)	Refer to BS EN 14582;2007	IC
Chlorine(Cl)	Refer to BS EN 14582:2007	IC
Bromine(Br)	Refer to BS EN 14582:2007	IC
Iodine(I)	Refer to BS EN 14582:2007	IC

Test Result(s)

Please refer to the following page(s).

Reviewed by Andry Change

Date

Apr. 24, 2013

Allen Wang

Technical Manager

No. 1428612964

Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000102620002

Page 2 of 3

Test Result(s)

Tested Item(s)	Result	MDL
Halogen(s)		
Fluorine(F)	N.D.	10 mg/kg
Chlorine(Cl)	5.62×10 ³ mg/kg	10 mg/kg
Bromine(Br)	N.D.	10 mg/kg
Iodine(I)	N.D.	10 mg/kg

Tested Sample/Part Description

Light yellow liquid

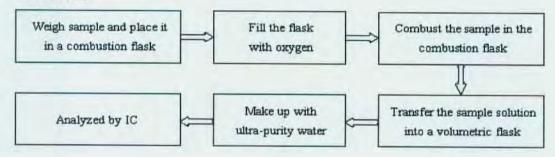
Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

Test Process





Report No. RLTJF000102620002

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.



Report No. RLTJF000102620001

Page 1 of 3

Applicant

BEIJING HYSTIC NEW MATERIALS CO., LTD.

Address

5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING, 100041,

CHINA.

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

Sample Name

EPOXY ADHESIVE

Part No.

EP608

Customer Reference

EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313.

Information

EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499,

EP500-EP599,EP600-EP699

Sample Received Date

Apr. 19, 2013

Testing Period

Apr. 19, 2013 to Apr. 24, 2013

Test Requested

As specified by client, to test Dibutyl phthalate(DBP), Benzyl butyl

phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP), Hexabromocyclododecane

(HBCDD) in the submitted sample(s).

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Dibutyl phthalate(DBP)	Refer to EN 14372 : 2004	GC-MS
Benzyl butyl phthalate(BBP)	Refer to EN 14372 : 2004	GC-MS
Di-2-ethylhexyl phthalate(DEHP)	Refer to EN 14372 : 2004	GC-MS
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3540C:1996	GC-MS

Test Result(s)

Please refer to the following page(s).

Reviewed by

Apr. 24, 2013

Andry Change

Approved by

Allen Wang

Date

No. 1428612964

Technical Manager Centre Testing International (Tianjin) Co., Ltd.

No.99, Xianfeng East Road, Dongli District, Tianjin, China





Report No. RLTJF000102620001

Page 2 of 3

Test Result(s)

Tested Item(s)	Result	MDL
Hexabromocyclododecane (HBCDD)	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
Phthalate		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Benzyl butyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-2-ethylhexyl phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg

Tested Sample/Part Description

Light yellow liquid

Note:

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

Test Process

1. Dibutyl phthalate(DBP), Di-2-ethylhexyl phthalate(DEHP), Benzyl butyl phthalate(BBP)





Report No. RLTJF000102620001

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.