



## ICP Test Report Certification Packet

Company name: Littelfuse, Inc.

Product Series: 3AG Fuse

Product #: 315xxxP Series

Issue Date: February 28, 2013

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive 2011/65/EU, recasting 2002/95/EC)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes. In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing processes, are all composed of the following components.

Issued by:   
KRISTEEN BACILA

<Global EHS Engineer>

(1) Parts, sub-materials and unit parts

This document covers the 3AG Fuse RoHS-Compliant series products manufactured by Littelfuse, Inc.

< Raw Materials Used

Please see Table 1

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1

Remarks :

**Table 1: List of Raw Materials covered by this report**

<b>Total Parts</b>	<b>Raw Material Part Number</b>	<b>Raw Material Description</b>	<b>Page(s)</b>
1	910-005	Cap	3-6
2	909-002-002	Body – Soda Lime Glass Tubes	7-11
3	909-194-002	Body	12-19
4	082xxx	Wire - Cu Sn Plated	20-27
5	497xxx	Wire – 99% Ni	28-33
6	692475	Solder	34-39
7	692476	Solder	34-39
8	692477	Solder	34-39
9	692535-003	Solder	40-44
10	648102	Yarn	45-52
11	087244	HMA	53-65
12	899-40X-1	Resistor	66-75
13	912-228	Spring	76-79
14	934-086 / 934-087 / 934-088	Overcap (Cap Base & Plating)	80-83
15	934-086 / 934-087 / 934-088	Overcap (Wire Base & Plating)	80-83
16	692539-003	Solder	84-88
17	909-194-001	Borosilicate Glass tube	89-93
18	425902	Ink - Black	94-104
19	425906	Ink - Brown	105-115



# TEST REPORT

NO.: A002R12050740-1R02

Date: May. 09, 2012

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: May. 07, 2012

Testing period: From May. 07, 2012 to May. 09, 2012

## Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2002/95/EC (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:

-\* 0.02 mg/kg refers to the MQL of sample extraction liquid.

## Conclusion:

-When tested as specified the submitted sample complied with the requirements of commission Decision of 18 Aug 2005 amending Directive 2002/95/EC notified under document 2005/618/EC.

\*\*\*\*\*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:

*Maggie*

Li Tingting, Maggie

Chemical Test Director

Reviewed by:

*Weikin*

Wang Wexin, Weikin

Technical Director

Approved by:

*Mickey*

Yuan Qi, Mickey

Lab Manager

SHENZHEN AOV TESTING TECHNOLOGY CO., LTD. KUNSHAN BRANCH

No. 8, Minguan Road North, Zhoushi, Kunshan, Jiangsu, China

Fax : 86-512-5510 8808 Http: //www.aovt.com

(Attention is drawn to the terms and conditions printed overleaf)



Hotline

86-512-5510 8000



# TEST REPORT

NO.: A002R12050740-1R02

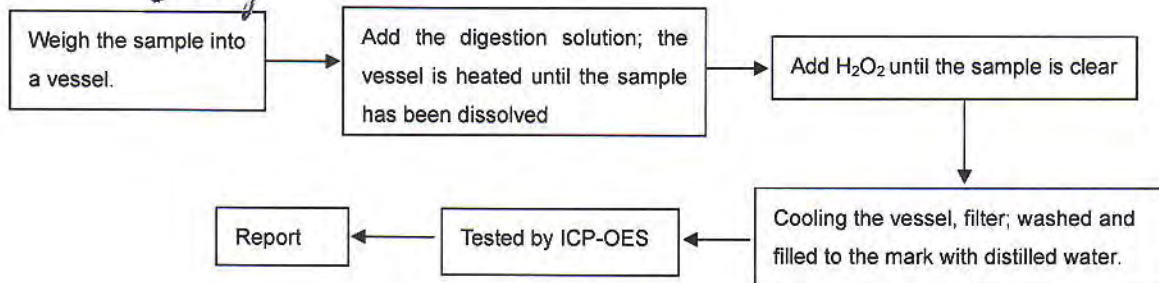
Date: May. 09, 2012

Page 2 of 4

## Test Flow:

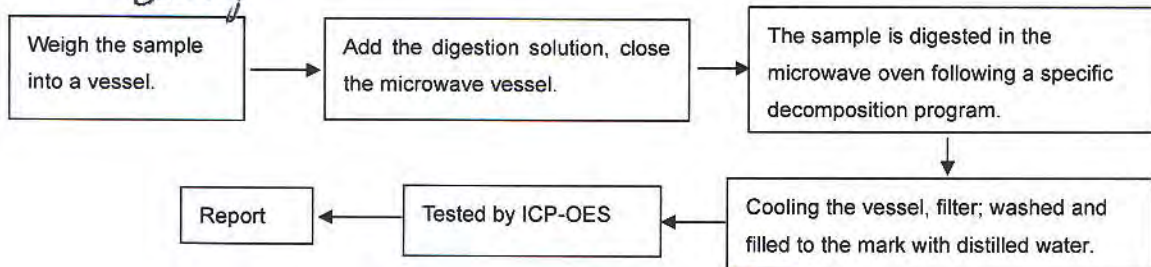
### 1. To Determine Lead, Cadmium Content: (Metal substrate)

Tested by: *Condy*



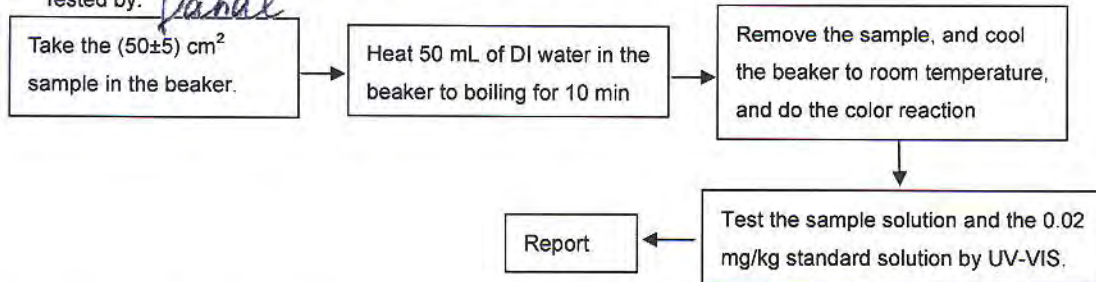
### 2. To Determine Mercury Content: (Metal substrate)

Tested by: *Condy*



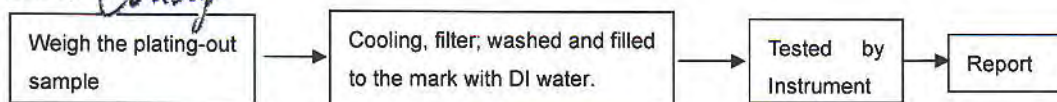
### 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate)

Tested by: *Danai*



### 4. To Determine Lead, Cadmium and Mercury Content: (Plating)

Tested by: *Condy*







## TEST REPORT

NO.: A002R12050740-1R02

Date: May. 09, 2012

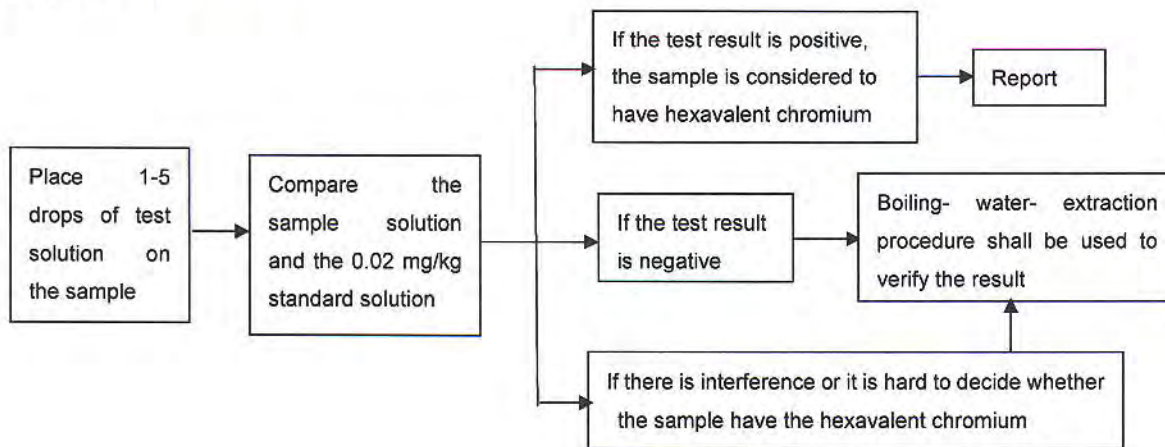
Page 3 of 4

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

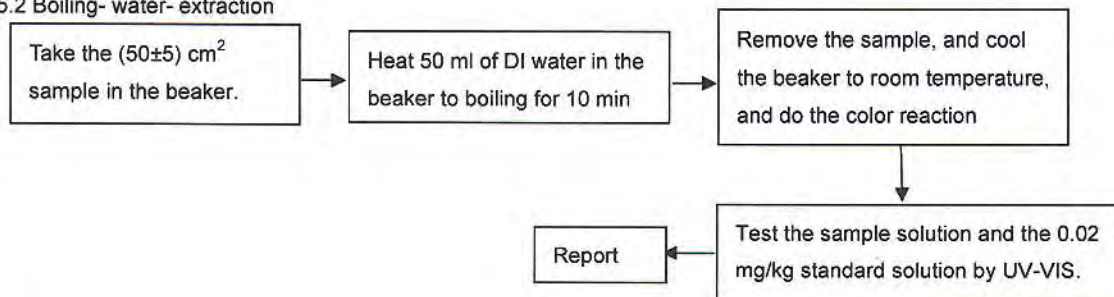
Tested by:

*Danale*

#### 5.1 Spot-test



#### 5.2 Boiling- water- extraction



#### Sample Description:

Code	Sample Description
1-1	Substrate
1-2	Plating

#### Test Results:

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





## TEST REPORT

NO.: A002R12050740-1R02

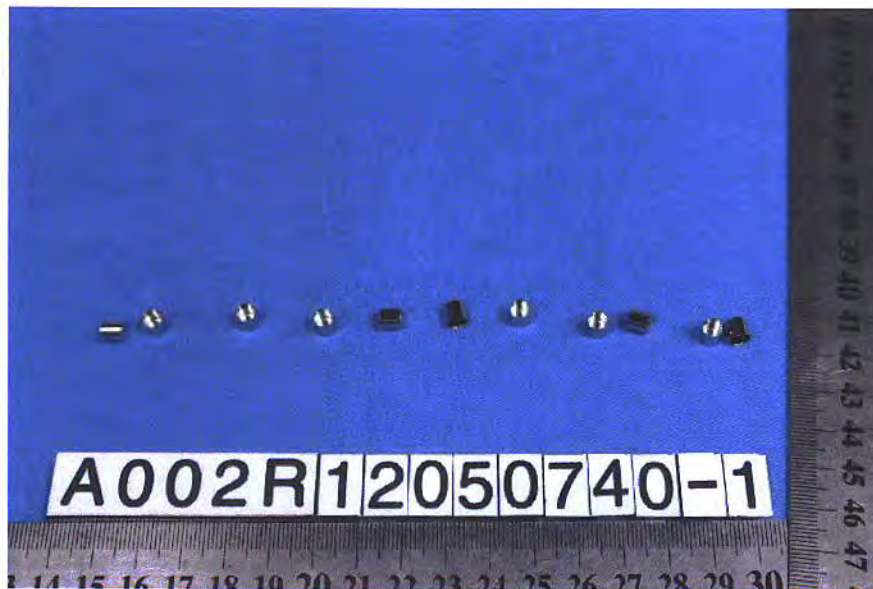
Date: May. 09, 2012

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### Note:

- The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.
- Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- mg/kg=ppm
- 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. CANEC1207912201

Date: 26 Jun 2012

Page 1 of 5

XIAMEN LICHUN ELECTRONIC ELEMENT CO.,LTD

42-2XINGLIN 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. : XM13901119EC - XM

Date of Sample Received : 18 Jun 2012

Testing Period : 18 Jun 2012 - 26 Jun 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.

Lucy Wu  
Approved Signatory

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## Test Report

No. CANEC1207912201

Date: 26 Jun 2012

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Test Results :

### Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN12-079122.001	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

- (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)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	229
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	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	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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## Test Report

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<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	-	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 the directive 2011/65/EU, Annex II

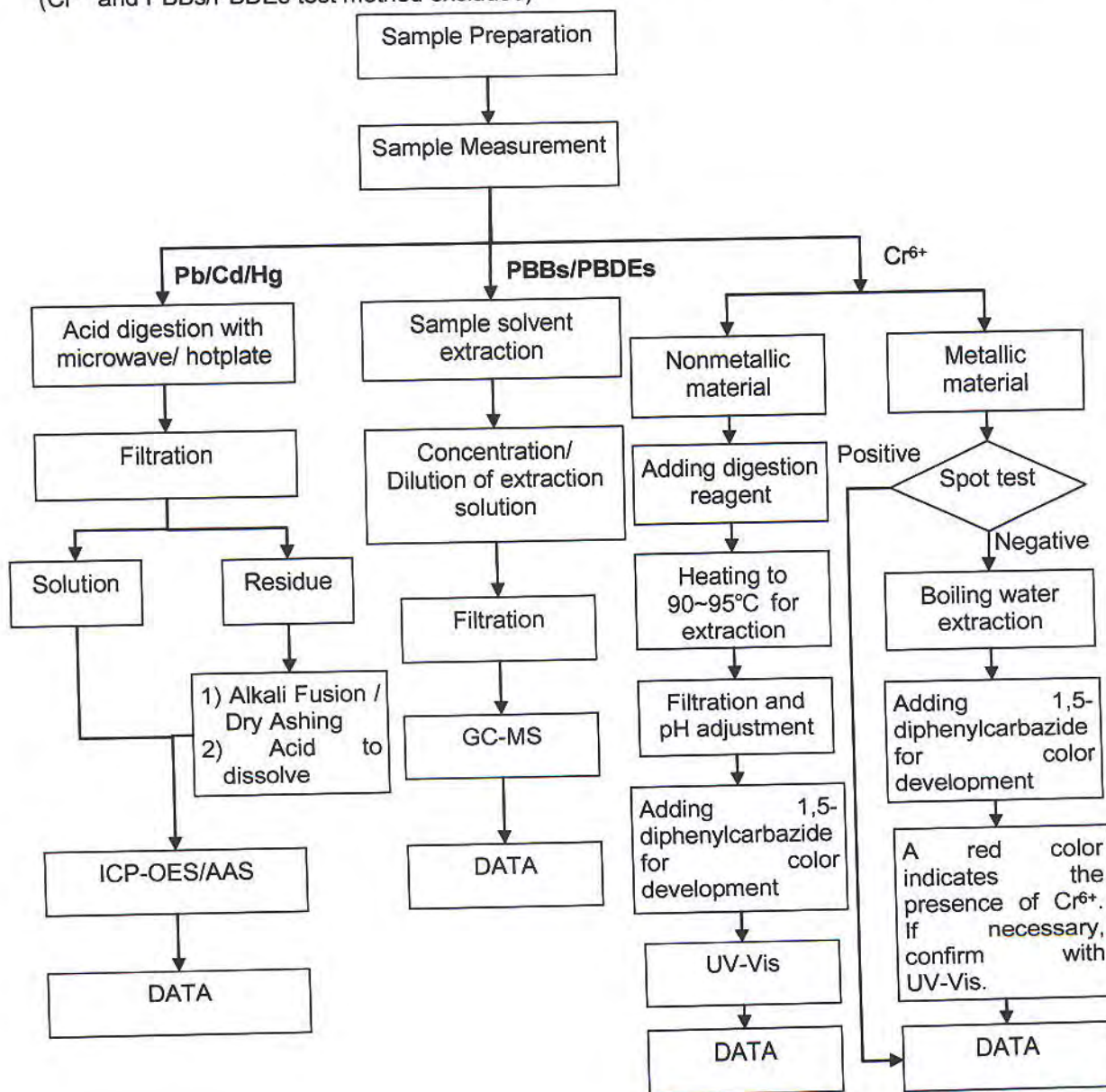
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## ATTACHMENTS

### RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang / Cutey Yu
- 2) Name of the person in charge of testing: Adams Yu / Ryan Yang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



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## Test Report

No. CANEC1207912201

Date: 26 Jun 2012

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Sample photo:



SGS authenticate the photo on original report only

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**TEST REPORT**

NUMBER: SHAH00335582

APPLICANT: LITTELFUSE, INC.  
800 E. NORTHWEST HWY  
ATTN: A.DIVIETRO/D.UNTIEDT

DATE: AUG 20, 2012

**SAMPLE DESCRIPTION:**

ONE(1) SUBMITTED SAMPLE SAID TO BE **Transparent glass.**

ITEM NAME : Glass body.

ITEM NO. : 909-194-002.

**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**

NUMBER: SHAH00335582

TESTS CONDUCTED

1 ( I ) Test Result Summary:

TESTING ITEM	RESULT (ppm)
<b>HEAVY METAL</b>	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr <sup>6+</sup> ) CONTENT	ND
<b>POLYBROMINATED BIPHENYLS (PBBs)</b>	
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
<b>POLYBROMINATED DIPHENYL ETHERS (PBDEs)</b>	
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
<b>HALOGEN CONTENT</b>	
FLUORINE (F)	ND
CHLORINE (Cl)	ND
BROMINE (Br)	ND
IODINE (I)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg  
 ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: DENT FANG / KEN HE

\*\*\*\*\*

TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00335582

**TESTS CONDUCTED**
**(II) ROHS REQUIREMENT:**

<u>RESTRICTED SUBSTANCES</u>	<u>LIMITS</u>
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr <sup>6+</sup> ) 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 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

**(III) TEST METHOD:**

<u>TESTING ITEM</u>	<u>TESTING METHOD</u>	<u>REPORTING LIMIT</u>
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 <sup>6+</sup> ) 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

\*\*\*\*\*

TO BE CONTINUED



**TEST REPORT**

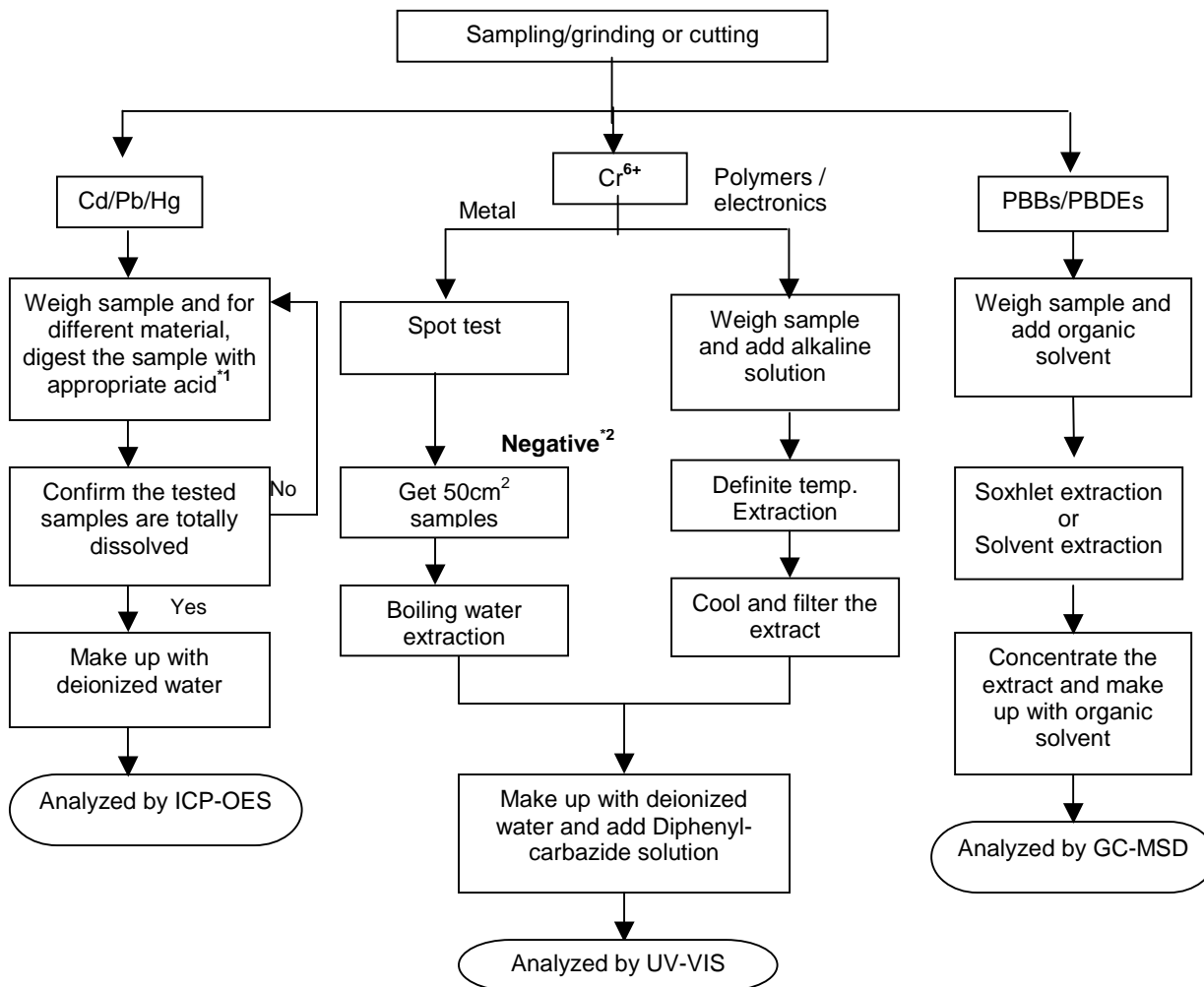
NUMBER: SHAH00335582

TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR Cd/ Pb/ Hg/ Cr (VI)/ PBBs/PBDES CONTENTS

REFERENCE STANDARD: IEC 62321 EDITION 1.0:2008



\*\*\*\*\*

TO BE CONTINUED



**TEST REPORT**

NUMBER: SHAH00335582

TESTS CONDUCTED

REMARKS:

\*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO <sub>3</sub> , HCL, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
METALS	HNO <sub>3</sub> , HCL, HF
ELECTRONICS	HNO <sub>3</sub> , HCL, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

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

\*\*\*\*\*

TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00335582

TESTS CONDUCTED

2 (I) Test Result Summary :

<u>Testing Item</u>	<u>Result (ppm)</u>
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million = mg/kg  
ND = Not detected

Responsibility Of Chemist : Ken He

(III) Test Method:

<u>Testing Item</u>	<u>Testing Method</u>	<u>Reporting Limit</u>
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 analyte in sample

Date Sample Received : Aug.16, 2012

Testing Period : Aug.16, 2012 To Aug.20, 2012

\*\*\*\*\*

TO BE CONTINUED

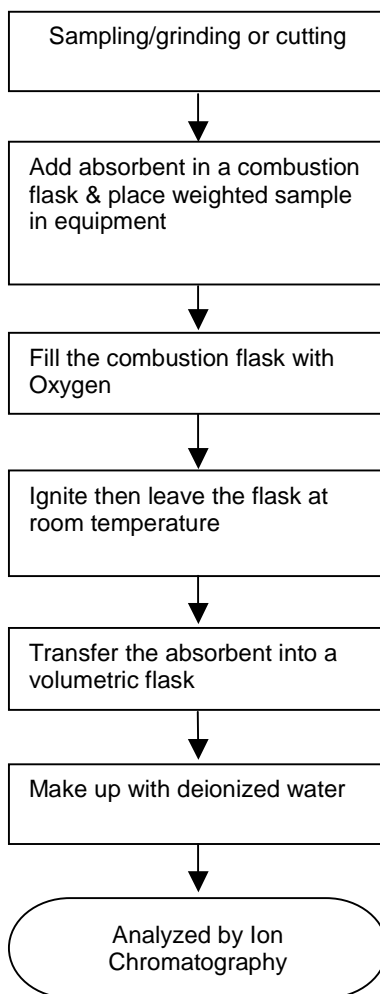


**TEST REPORT**

NUMBER:     SHAH00335582

**TESTS CONDUCTED**

(V) MEASUREMENT FLOWCHART:  
TEST FOR HALOGEN CONTENT  
REFERENCE STANDARD: EN 14582



\*\*\*\*\*  
TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00335582

TESTS CONDUCTED



\*\*\*\*\*  
END OF REPORT

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**Test Report**

Number : TWNC00296620

Applicant: Elschukom Elektroschutzkomponentenbau  
GmbH  
Gewerbestrasse 87, D-98669 Veilsdorf,  
Germany

Date : Jan 30, 2013

**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



Page 1 of 8

**Intertek Testing Services Taiwan Ltd.**

8F., No. 423, Ruiguang Rd., Neihu District, Taipei 11492, Taiwan, R.O.C.

全國公證檢驗股份有限公司

11492 台北市內湖區瑞光路 423 號 8 樓

Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2410

**Test Report**

Number : TWNC00296620

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



Page 2 of 8

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**Test Report**

Number : TWNC00296620

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:

<u>Test Item</u>	<u>Unit</u>	<u>Test Method</u>	<u>Result</u>	<u>RL</u>
			<u>Mixed all kinds of metal wire</u>	
<b>Heavy Metal</b>				
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 <sup>6+</sup> ) content	mg/kg with 50 cm <sup>2</sup>	With reference to IEC 62321: 2008, by boiling water extraction and determined by UV-Vis Spectrophotometer.	Negative (#)	0.02

Remarks: ppm = parts per million based on weight of tested sample = mg/kg  
ND = Not detected  
RL = Reporting Limit, Quantitation limit of analyte in sample  
mg/kg with 50cm<sup>2</sup> = 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 cm<sup>2</sup> 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

## ( II ) RoHS Limits:

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

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

---

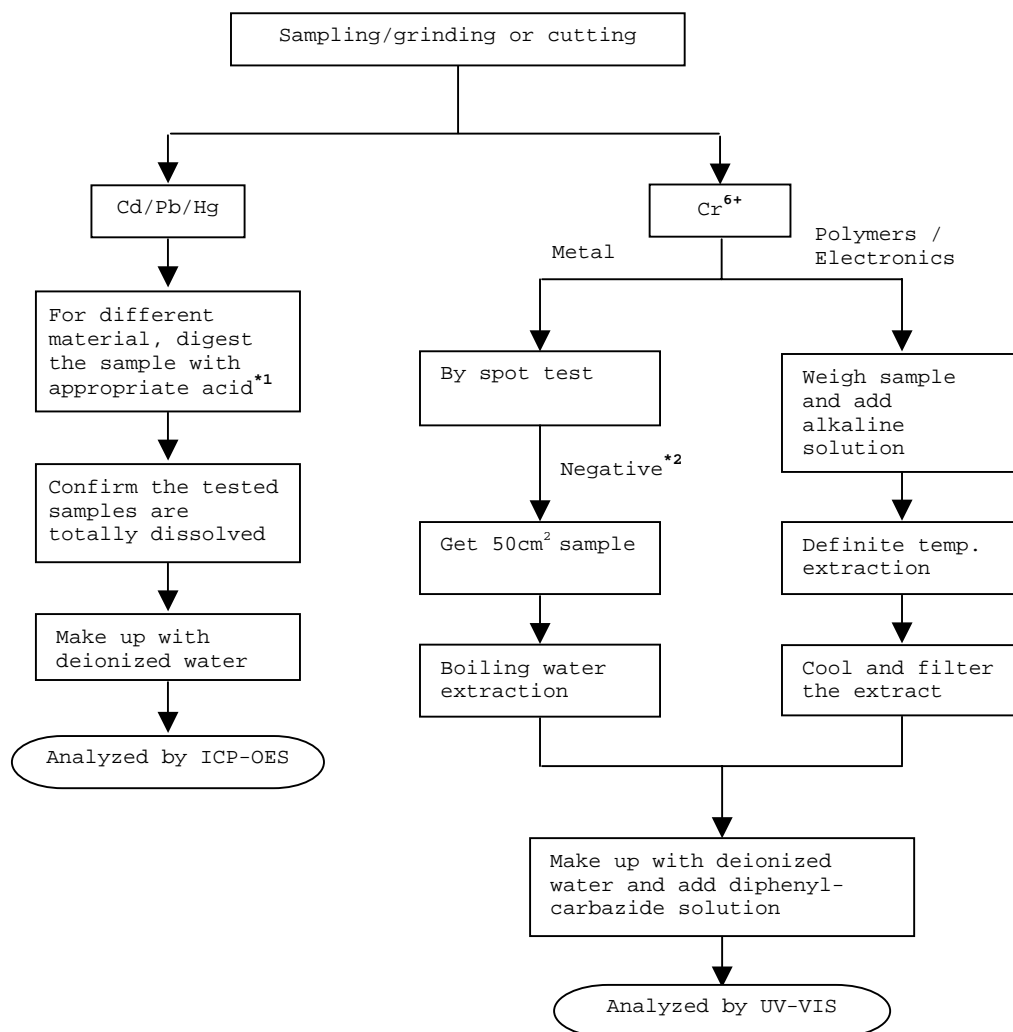


Test Conducted

## (III) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)

Reference Standard: IEC 62321 edition 1.0:2008





Number : TWNC00296620

## Test Conducted

### Remarks:

\*1: List of Appropriate Acid:

Material	Acid Added for Digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

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

---

End of Report

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Page 7 of 8

### Intertek Testing Services Taiwan Ltd.

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Tel: (+886-2) 6602-2888 · 2797-8885 Fax: (+886-2) 6602-2410

Number : TWNC00296620

Test Conducted

Photo





**Polyfil AG**  
Gina Gregorio  
Oberallmendstrasse 20A

**6300 Zug / Switzerland**

Fürth, 2012-12-19

## Test report No. FUHL1236940

### Testing of a material sample according to the RoHS directive 2011/65/EC

#### Sample description: Ni99.9 wire

Arrival in lab: 2012-012-04; Period of XRF analysis incl. sample preparation and photo documentation: 2012-12-07 – 2012-12-10  
Head of Inorganic Lab: Claudia List

Copying this test report is permitted only in agreement with the contracted lab. The test results refer only to the tested item.  
This report consists of 6 page(s).  
The test methods signed with \* are not listed in the attachment of the accreditation certificate.

#### Conclusion based on tested item

Test order	Status
testing according to the RoHS directive 2011/65/EC	conform <sup>°</sup>

<sup>°</sup> Please see overview of test results

- Test results see next pages -

**Sample description: Ni99.9 wire**

**nM = non Metal**

**M = Metal**

**cM = composite Material**

**List of component parts:**

Sample No.	Part No.	Material	Description
236940	1	M	Ni99.9 wire

**Sample description: Ni99.9 wire**

**Comment**

LOD = Limit of Detection  
 BL = Below Limit  
 OL = Over Limit  
 X = Inconclusive, further test necessary  
 $\sigma$  = Standard deviation  
  
 CS = Composite sample

**Remark:**

Results were obtained by EDXRF for primary screening. Additional chemical testing using ICP (for Cd, Pb), AAS (for Hg), IC-UC/VIS (for CrVI) and GC/MS (for PBBs/PBDEs) are recommended, if the concentration exceeds the below warning value according to IEC 62321.

Element	Unit	non - metal	metal
Cd	mg / kg	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$
Pb	mg / kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$
Hg	mg / kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$
Br	mg / kg	$BL \leq (300-3\sigma) < X$	--
Cr	mg / kg	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$

Element	Unit	composite material
Cd	mg / kg	$LOD < X < (150+3\sigma) \leq OL$
Pb	mg / kg	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	mg / kg	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	mg / kg	$BL \leq (250-3\sigma) < X$
Cr	mg / kg	$BL \leq (500-3\sigma) < X$

**Sample description: Ni99.9 wire**

**1. XRF screening**

Method: XRF according to IEC 62321:2008\*

Sample No.	Part No.	Pb	Hg	Cd	Cr <sub>total</sub>	Br	Status
236940	1	BL	BL	BL	BL	--	conform

**Comment:**

Elements	RoHS-limit value
Lead (Pb)	1000 mg/kg
Mercury (Hg)	1000 mg/kg
Cadmium (Cd)	100 mg/kg
Chromium VI (Cr VI)	1000 mg/kg
Polybrominated Biphenyle (PBBs)	1000 mg/kg
Polybrominated Diphenyl ether (PBDEs)	1000 mg/kg

**Intertek Consumer Goods GmbH**

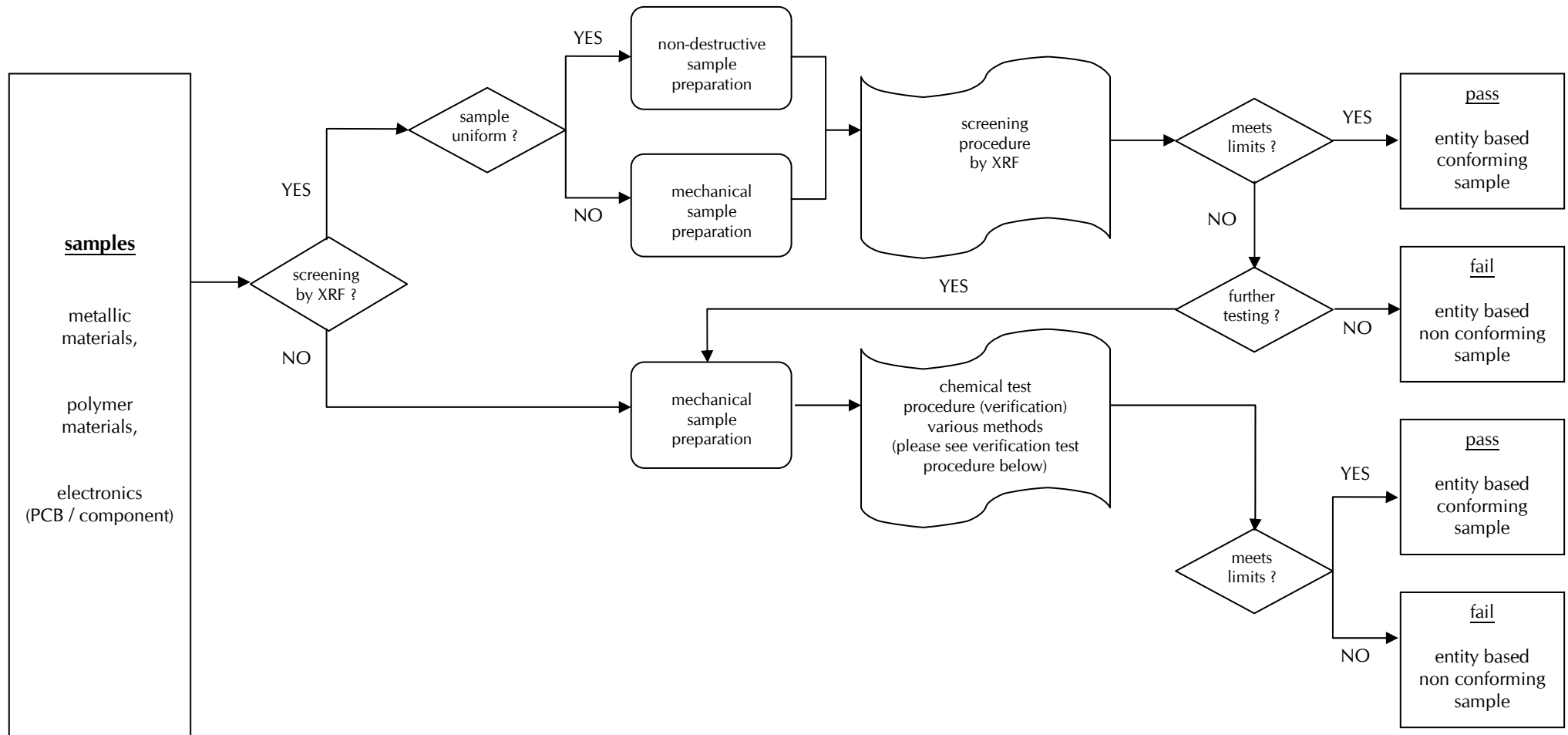


Prüfleitung / Lab Manager

☐ A. Breunig, ☐ K. Grönhardt, ☐ Dr. K. Laue-Schuler, ☒ C. List, ☐ D. Löw  
☐ R. Micolay, ☐ M. Neumeister, ☐ Dr. R. Rätze, ☐ K. Scharrer, ☐ M. Tutsch

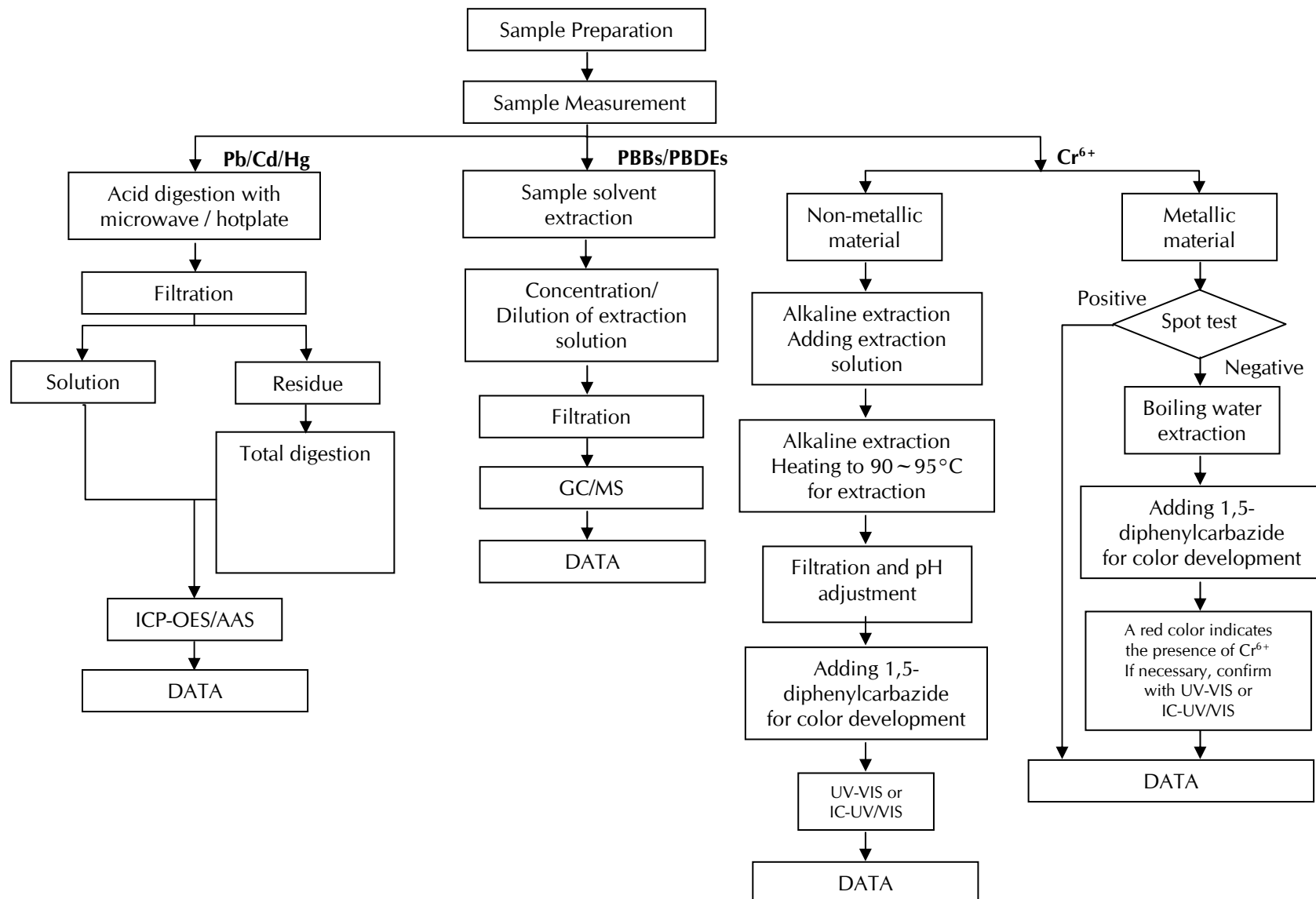
- Flow charts see next page(s) -

## Test procedure





## Verification test procedure





**Test Report**

Number: SHAH00366749

Applicant: LITTELFUSE, INC.  
800 E. NORTHWEST HWY  
Attn: A.DIVIETRO/D.UNTIEDT

Date: FEB 27, 2013

**Sample Description:**

One(1) submitted sample said to be **Silvery Metal**.

Item Name : Solder(97%Sn3%Cu).

Part No. : 692475/692476/692477.

**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

## 1. ( I ) Test Result Summary:

Testing Item	Result (ppm)
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	142
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg With 50cm <sup>2</sup> )	Negative (< 0.02)(#)
<b>Polybrominated Biphenyls (PBBs)</b>	
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
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>	
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  
mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre

Responsibility of Chemist: Dent Fang / Leaf Liu

## ( II ) RoHS Requirement:

Restricted substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) 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.

\*\*\*\*\*

To be continued

## 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 <sup>6+</sup> ) 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 <sup>2</sup>
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

2. Halogen content

## ( I ) Test result summary:

Testing item	Result (ppm)
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (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
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 analyte in sample

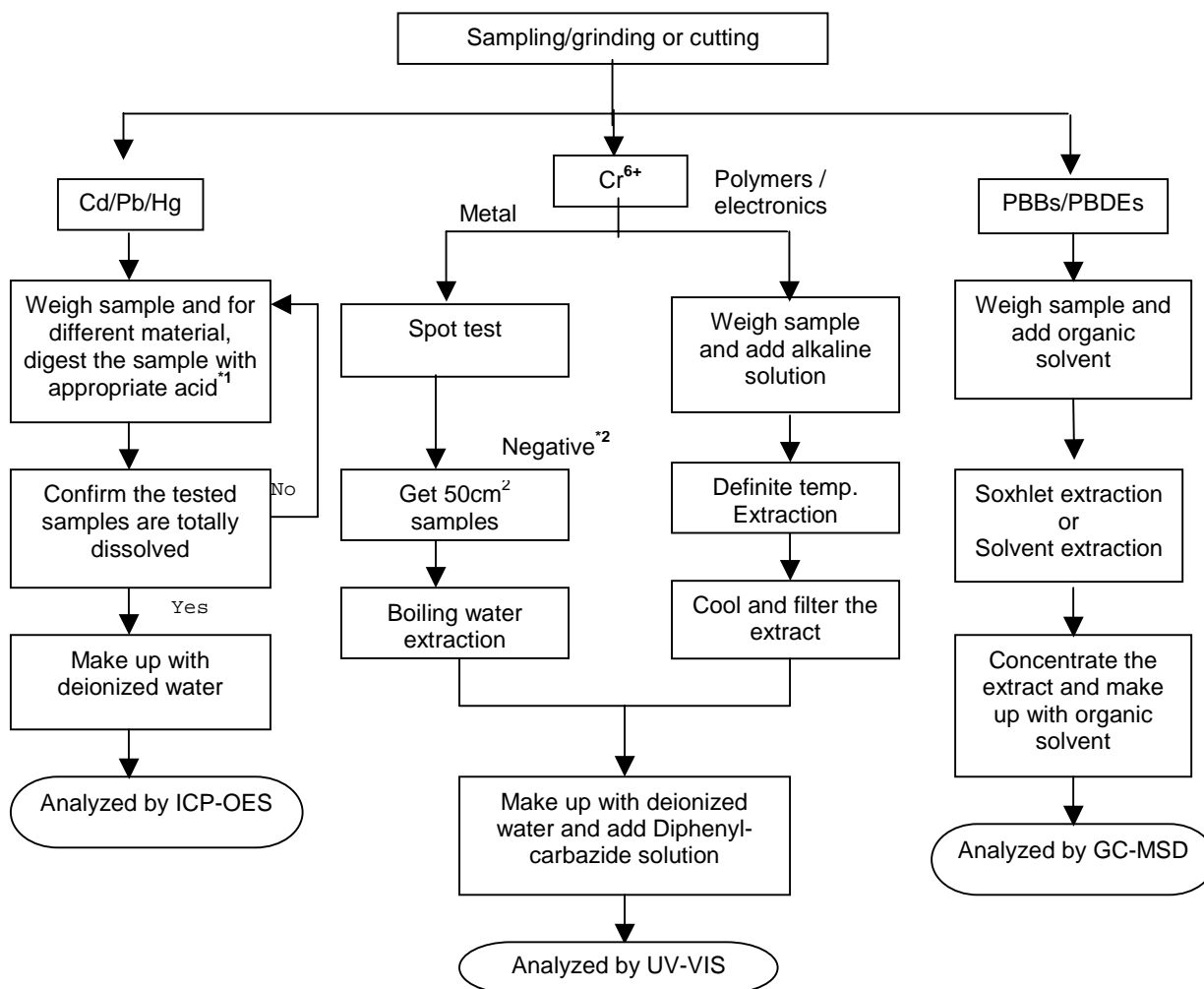
Date sample received: Feb.21, 2013

Testing period: Feb.21, 2013 to Feb.26, 2013

\*\*\*\*\*

To be continued

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 <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> ,HCL,HF
Electronics	HNO <sub>3</sub> ,HCL,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

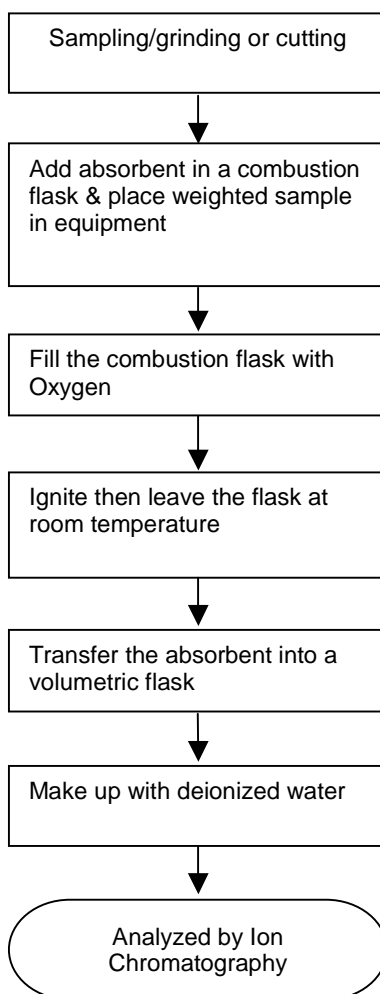
\*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.

\*\*\*\*\*

To be continued



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



\*\*\*\*\*  
To be continued

Tests Conducted



\*\*\*\*\*  
End of report

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## Test Report

No. SHAEC1216714748

Date: 25 Sep 2012

Page 1 of 5

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. : SP12-028285 - SH  
Part No. (P/N) : YTW108 (692535-001、692535-003)  
Composition : Sn3.0CuRE  
Date of Sample Received : 21 Sep 2012  
Testing Period : 21 Sep 2012 - 25 Sep 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.



Fan Jingjie, JJ  
Approved Signatory

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HL: (86-21) 61402594 HL: (86-21) 54500353

[www.cn.sgs.com](http://www.cn.sgs.com)  
[sgs.china@sgs.com](mailto:sgs.china@sgs.com)



## Test Report

No. SHAEC1216714748

Date: 25 Sep 2012

Page 2 of 5

Test Results :

### Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA12-167147.041	Silvery 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 : 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 Spot test / Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	Limit	Unit	MDL	041
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	55
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	◇	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

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Testing Center

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## Test Report

No. SHAEC1216714748

Date: 25 Sep 2012

Page 3 of 5

Test Item(s)	Limit	Unit	MDL	041
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 cm<sup>2</sup> sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

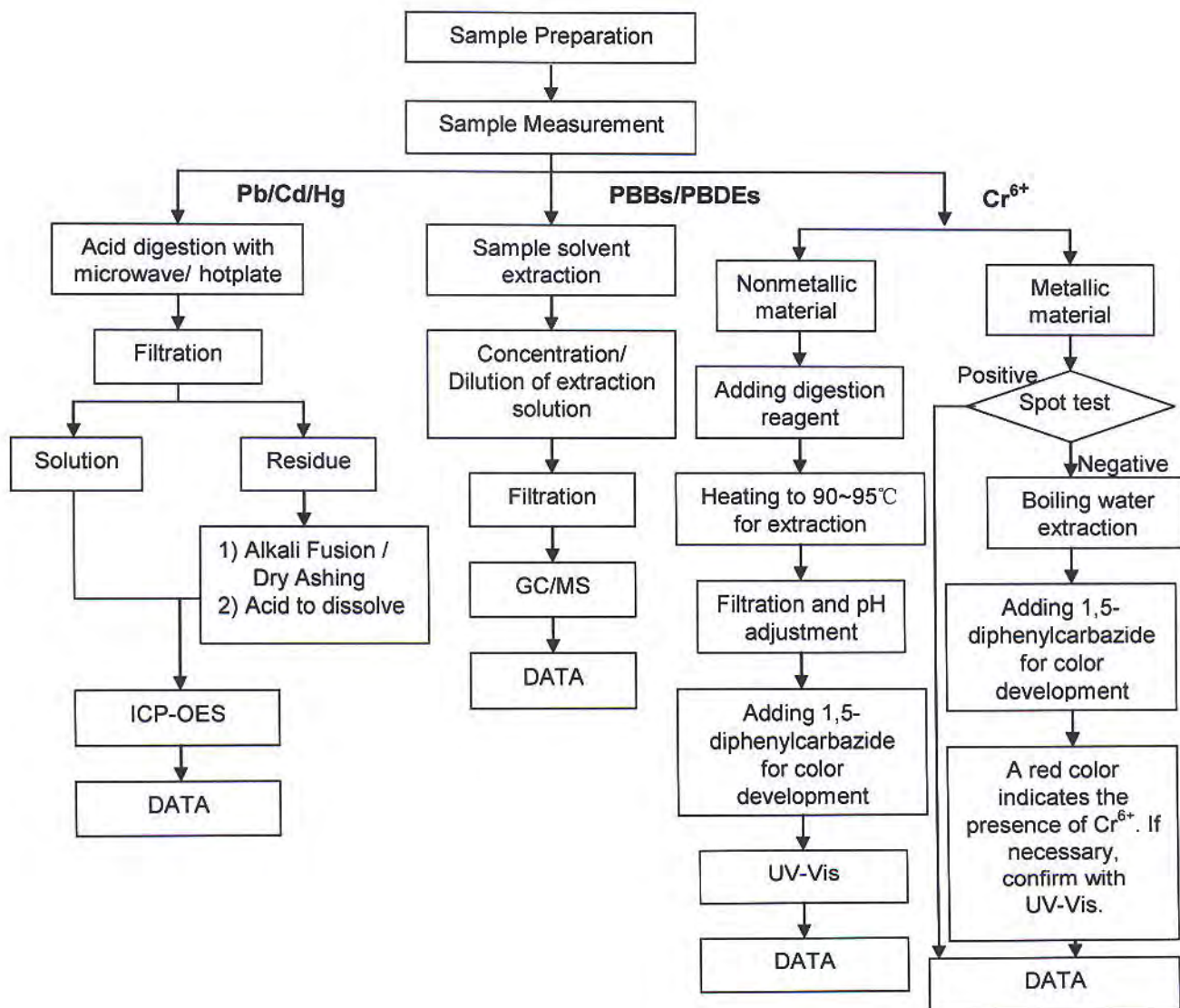
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## ATTACHMENTS

### 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
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. ( $\text{Cr}^{6+}$  and PBBs/PBDEs test method excluded)



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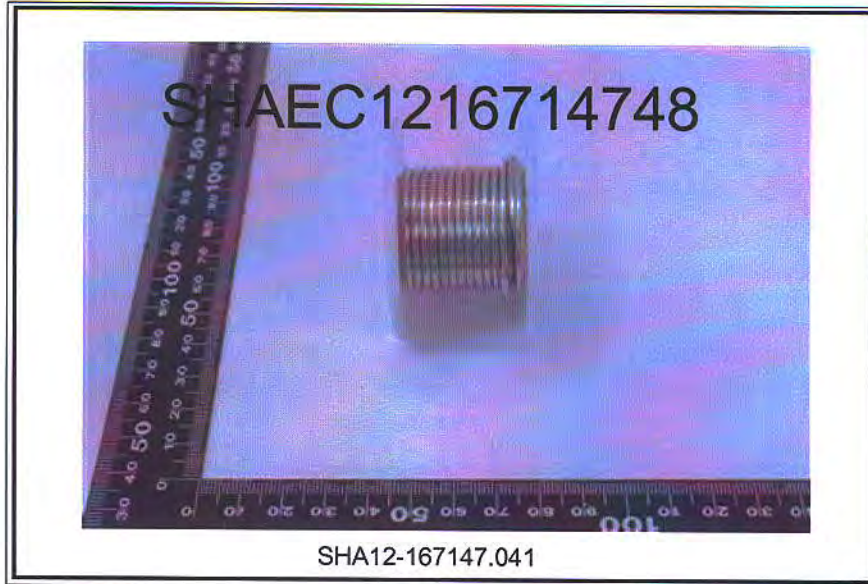
## Test Report

No. SHAEC1216714748

Date: 25 Sep 2012

Page 5 of 5

Sample photo:



SGS authenticate the photo on original report only

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**TEST REPORT**

NUMBER: SHAH00334352

APPLICANT: LITTELFUSE, INC.  
800 E. NORTHWEST HWY  
ATTN: A. CESISTA/ K. BACILA

DATE: AUG 15, 2012

**SAMPLE DESCRIPTION:**

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

Part Description : Yarn.

Part Number : 648102.

\*\*\*\*\*

**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**

NUMBER: SHAH00334352

TESTS CONDUCTED

1 (I) Test Result Summary:

TESTING ITEM	RESULT (ppm)
<b>HEAVY METAL</b>	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr <sup>6+</sup> ) CONTENT	ND
<b>POLYBROMINATED BIPHENYLS (PBBs)</b>	
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
<b>POLYBROMINATED DIPHENYL ETHERS (PBDEs)</b>	
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
<b>HALOGEN CONTENT</b>	
FLUORINE (F)	ND
CHLORINE (Cl)	ND
BROMINE (Br)	ND
IODINE (I)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg  
ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: DENT FANG / KEN HE

\*\*\*\*\*

TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00334352

**TESTS CONDUCTED**
**(II) ROHS REQUIREMENT:**

<u>RESTRICTED SUBSTANCES</u>	<u>LIMITS</u>
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr <sup>6+</sup> ) 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 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

**(III) TEST METHOD:**

<u>TESTING ITEM</u>	<u>TESTING METHOD</u>	<u>REPORTING LIMIT</u>
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 <sup>6+</sup> ) 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

Date Sample Receive: AUG.9, 2012

Test Period: AUG.9, 2012 To AUG.15, 2012

RESPONSIBILITY OF CHEMIST: KEN HE

\*\*\*\*\*

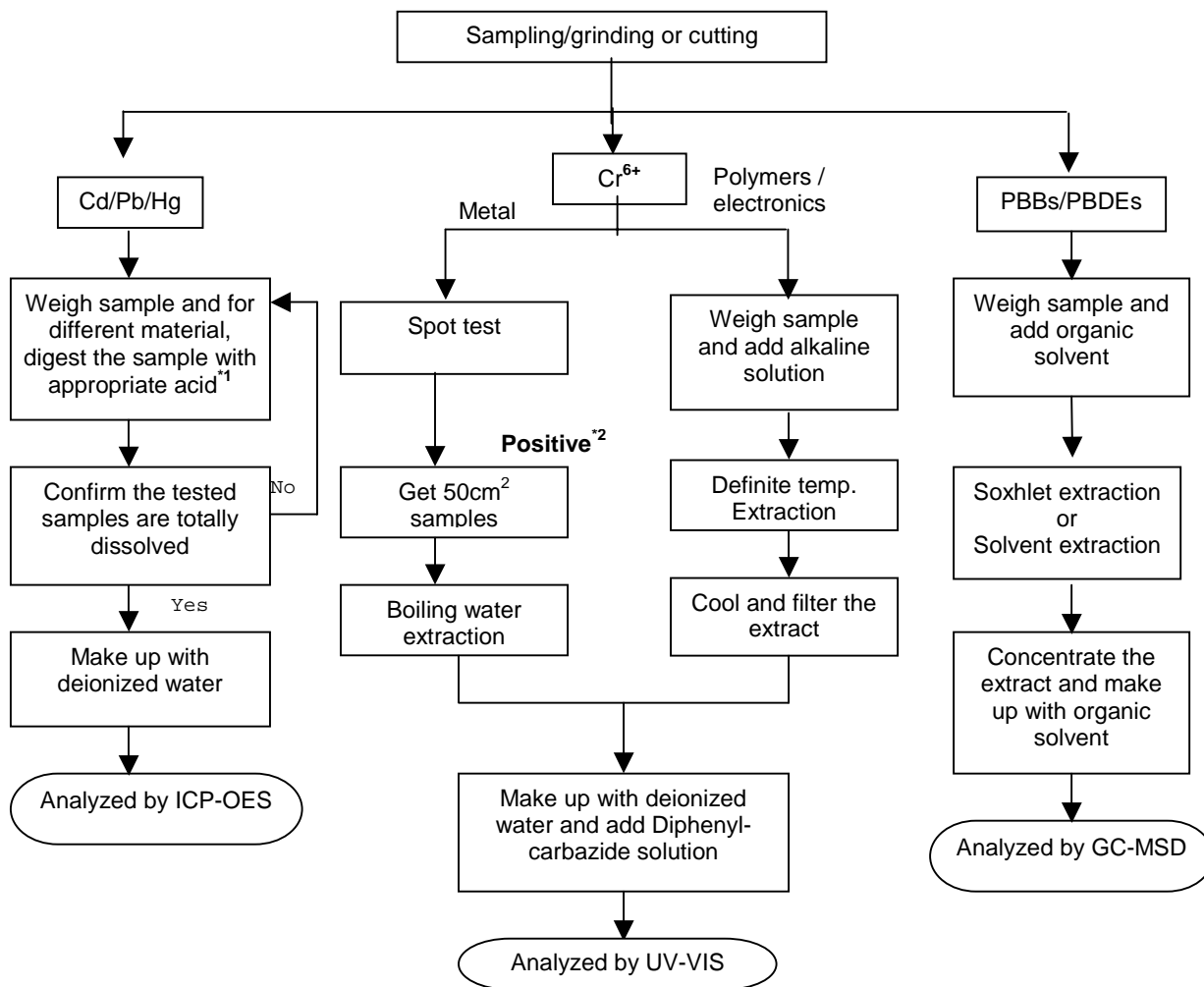
TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00334352

TESTS CONDUCTED

(IV) MEASUREMENT FLOWCHART:  
 TEST FOR Cd/ Pb/ Hg/ Cr (VI)/ PBBs/PBDES CONTENTS  
 REFERENCE STANDARD: IEC 62321 EDITION 1.0:2008



TO BE CONTINUED



**TEST REPORT**

NUMBER: SHAH00334352

TESTS CONDUCTED

REMARKS:

\*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO <sub>3</sub> , HCL, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
METALS	HNO <sub>3</sub> , HCL, HF
ELECTRONICS	HNO <sub>3</sub> , HCL, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

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

\*\*\*\*\*

TO BE CONTINUED





**TEST REPORT**

NUMBER: SHAH00334352

TESTS CONDUCTED

2 (I) Test Result Summary :

<u>Testing Item</u>	<u>Result (ppm)</u>
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million = mg/kg  
ND = Not detected

(III) Test Method:

<u>Testing Item</u>	<u>Testing Method</u>	<u>Reporting Limit</u>
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 analyte in sample

\*\*\*\*\*

TO BE CONTINUED

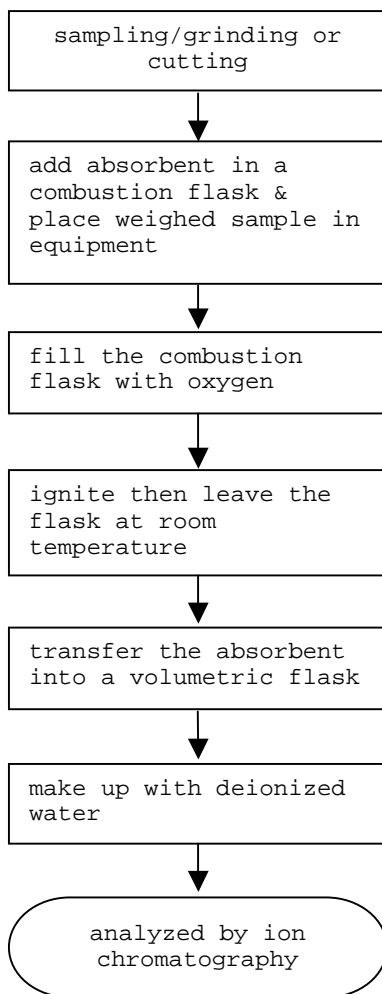
**TEST REPORT**

NUMBER:     SHAH00334352

**TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content  
Reference Standard: EN 14582



\*\*\*\*\*  
TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00334352

TESTS CONDUCTED



\*\*\*\*\*  
END OF REPORT

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## Test Report

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).

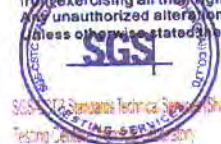
Conclusion : Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of  
SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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SGS-CSTC Technical Service (Shanghai) Co. Ltd.  
Testing Center (Shanghai Branch)

3<sup>rd</sup> 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

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e [sgs.china@sgs.com](mailto:sgs.china@sgs.com)

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# Test Report

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)	Limit	Unit	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	-	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

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## Test Report

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<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	-	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 the directive 2011/65/EU, Annex II

### Hexabromocyclododecane (HBCDD)

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

### Notes :

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

### Phthalates

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Dibutyl Phthalate (DBP)	%	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.

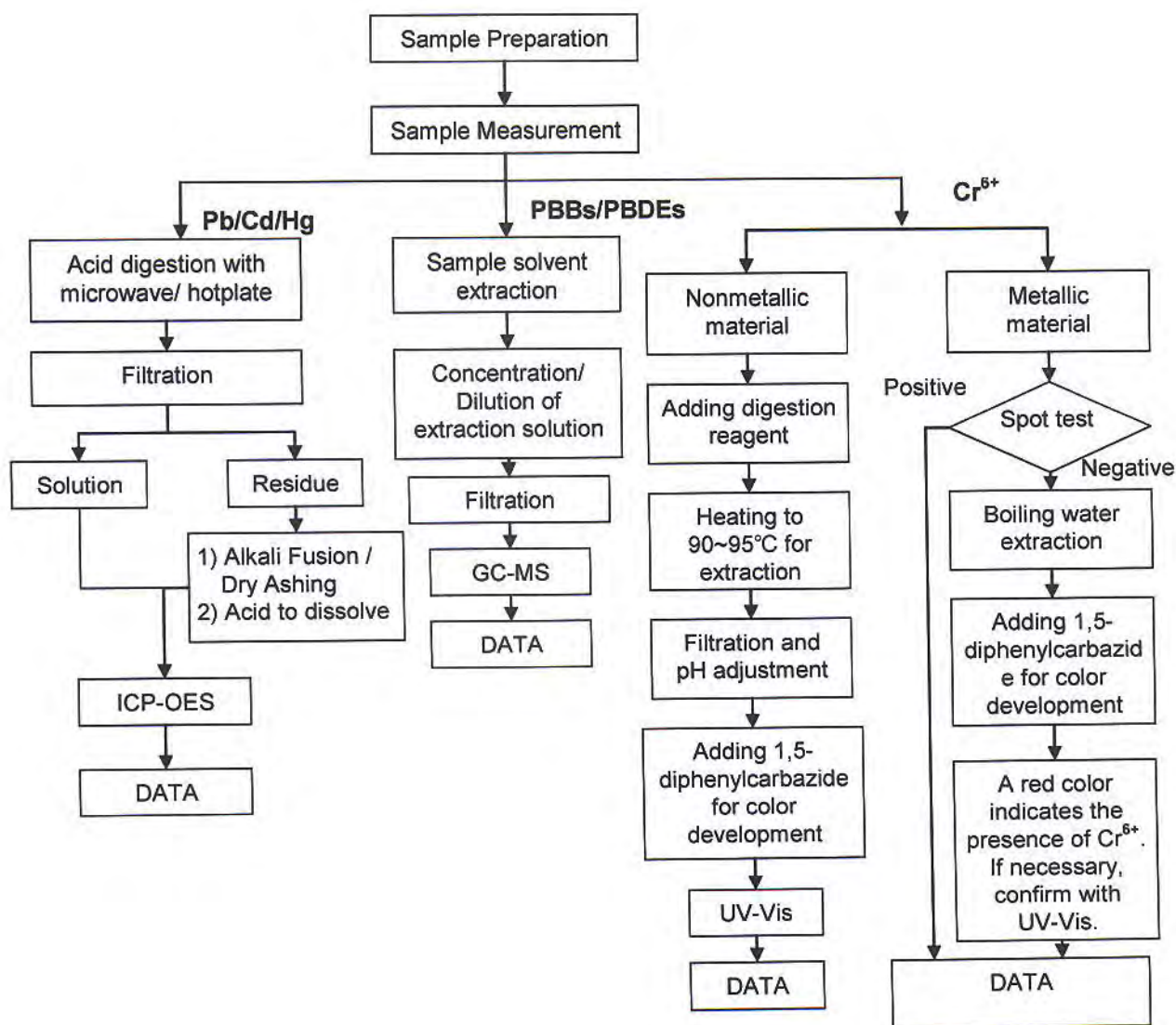
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### ATTACHMENTS

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

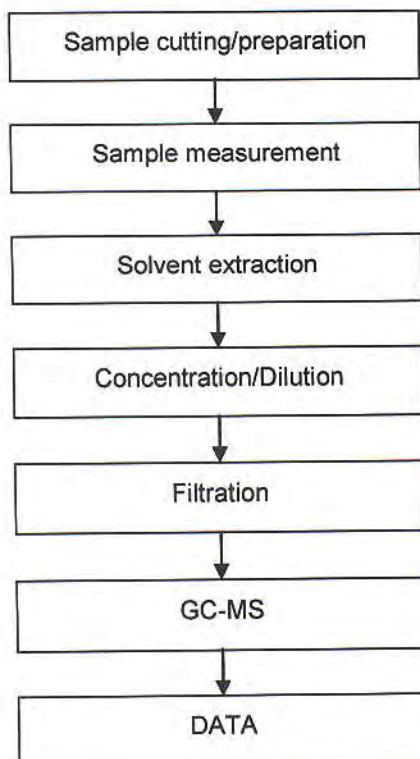


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## Phthalates Testing Flow Chart

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

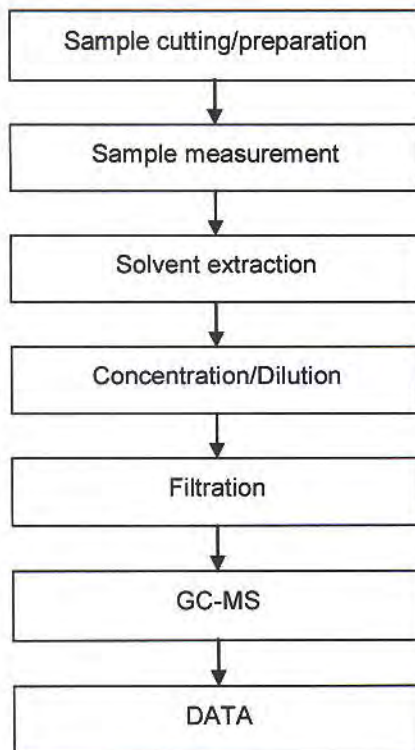


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## HBCDD Testing Flow Chart

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



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## Test Report

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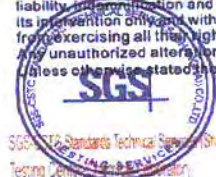
Sample photo:



SGS authenticate the photo on original report only

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

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SGS Standards Technical Services (Shanghai) Co., Ltd.  
Testing Center (Shanghai Branch)

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## Test Report

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

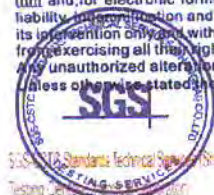
SGS Job No. : SP12-033081 - SH  
Date of Sample Received : 14 Nov 2012  
Testing Period : 14 Nov 2012 - 19 Nov 2012  
Test Requested : Selected test(s) as requested by client.  
Test Method : Please refer to next page(s).  
Test Results : Please refer to next page(s).

Signed for and on behalf of  
SGS-CSTC Ltd.

JJ Fan

Approved Signatory

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## Test Report

No. SHAEC1219975401

Date: 19 Nov 2012

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Test Results :

### Test Part Description :

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

Remarks :

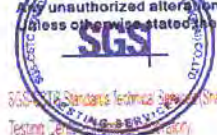
- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

### Halogen

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

Test Item(s)	Unit	MDL	001
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

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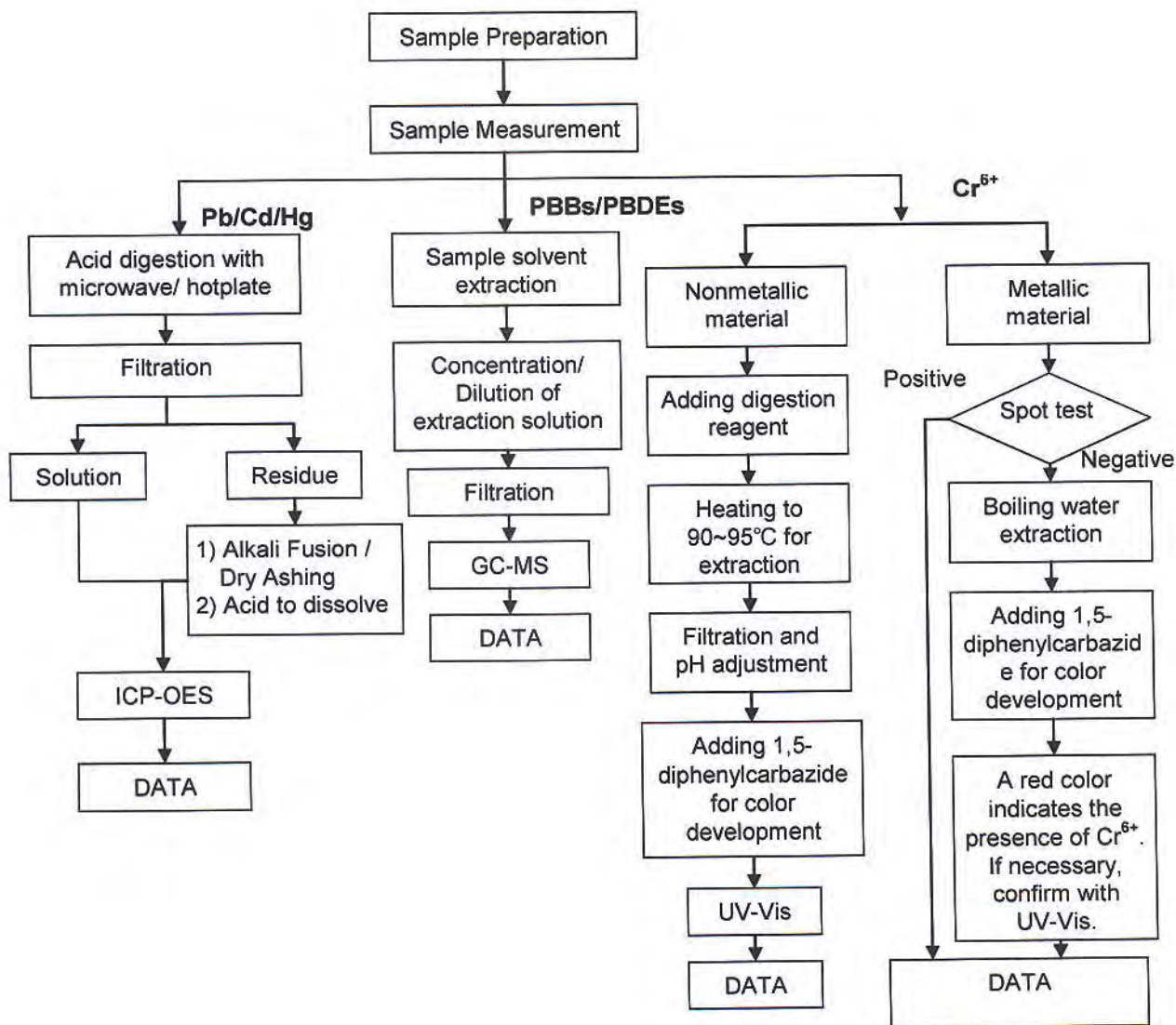
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## ATTACHMENTS

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

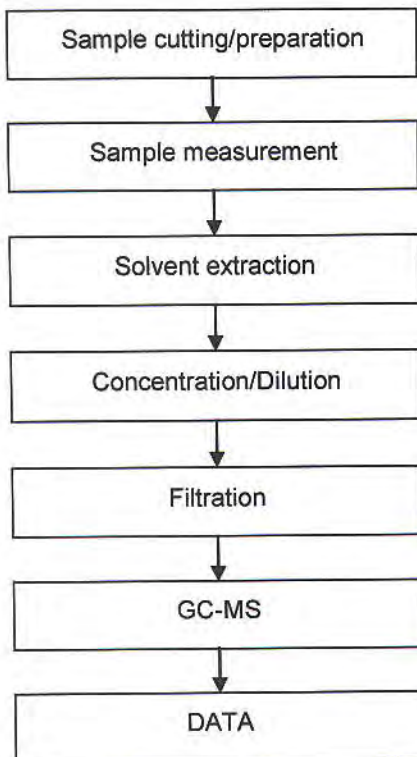


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## Phthalates Testing Flow Chart

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

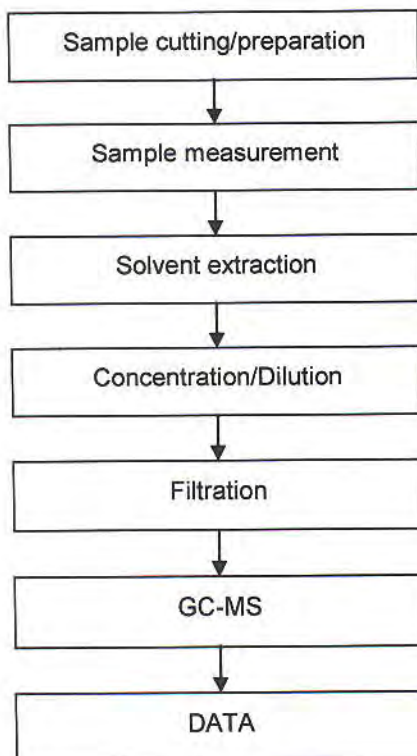


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## HBCDD Testing Flow Chart

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



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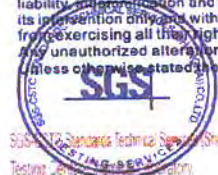
Sample photo:



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測試報告  
Test Report

號碼(No.) : CE/2012/41404

日期(Date) : 2012/04/13

頁數(Page): 1 of 6

幸亞電子工業股份有限公司

TY-OHM ELECTRONIC WORKS CO., LTD.

桃園縣龜山鄉頂湖一街49號

NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN



以下測試樣品係由客戶送樣，且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

樣品名稱(Sample Description) : CARBON FILM RESISTORS

樣品型號(Style/Item No.) : RD SERIES

收件日期(Sample Receiving Date) : 2012/04/07

測試期間(Testing Period) : 2012/04/07 TO 2012/04/13

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).



Chenyu Kung / Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory – Taipei

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## 測試報告 Test Report

號碼(No.) : CE/2012/41404

日期(Date) : 2012/04/13

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幸亞電子工業股份有限公司

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### 測試結果(Test Results)

測試部位(PART NAME)No.1 : 整體混測 (MIXED ALL PARTS)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考 IEC 62321: 2008 方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg		2	n.d.
汞 / Mercury (Hg)	mg/kg		2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考 IEC 62321: 2008 方法, 以 UV-VIS 檢測. / With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
多溴聯苯總和 / Sum of PBBs	mg/kg	參考 IEC 62321: 2008 方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n.d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n.d.
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n.d.

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# 測試報告

## Test Report

號碼(No.) : CE/2012/41404

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考 IEC 62321: 2008 方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.

### 備註(Note) :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. 樣品的測試是基於申請人要求混合測試, 報告中的混合測試結果不代表其中個別單一材質的含量. (The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

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號碼(No.) : CE/2012/41404

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幸亞電子工業股份有限公司

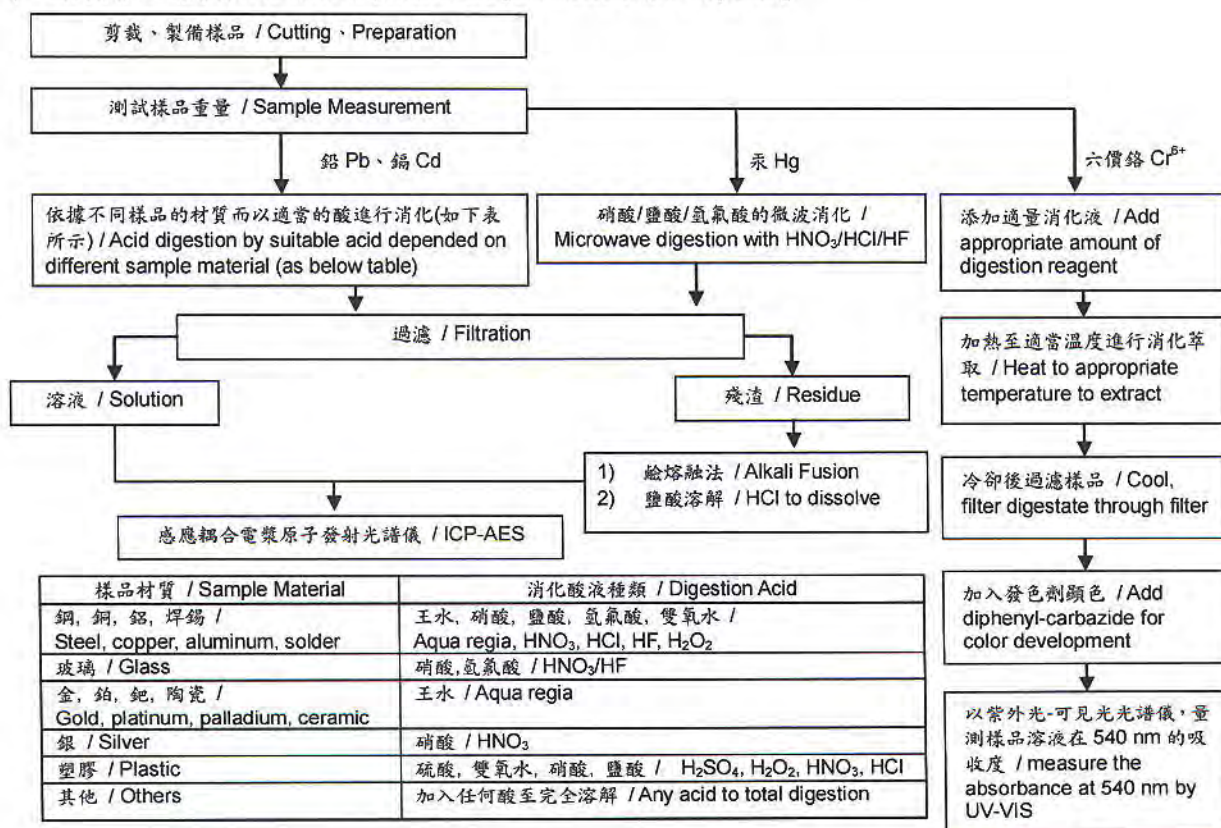
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NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN



- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人：張修興 / Name of the person in charge of measurement: Troy Chang



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### 多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

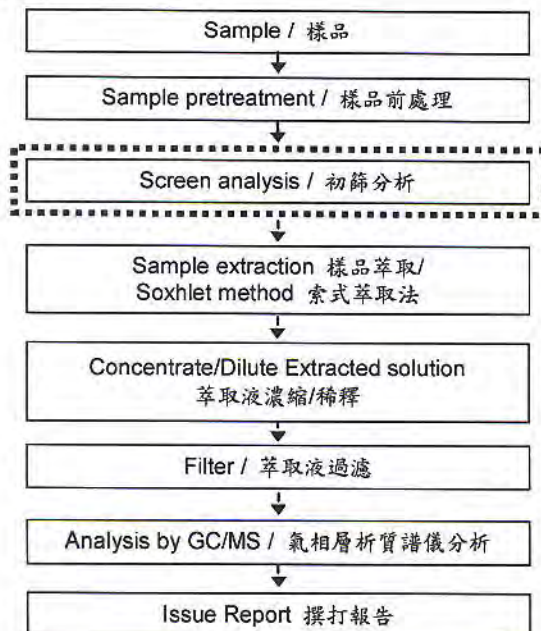
■ 測試人員：翁賜彬 / Name of the person who made measurement: Roman Wong

■ 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang

初次測試程序 / First testing process →

選擇性篩檢程序 / Optional screen process .....→

確認程序 / Confirmation process - - -→



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## 測試報告 Test Report

號碼(No.) : CE/2012/41404

日期(Date) : 2012/04/13

頁數(Page): 6 of 6

幸亞電子工業股份有限公司

TY-OHM ELECTRONIC WORKS CO., LTD.

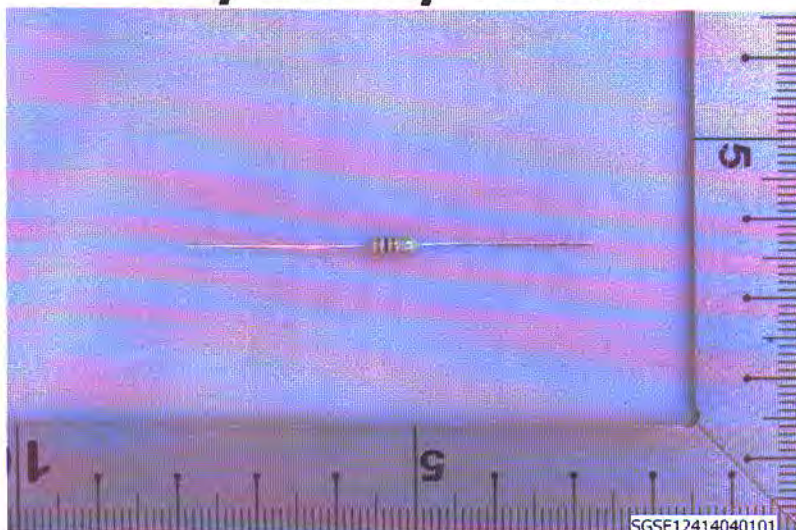
桃園縣龜山鄉頂湖一街49號

NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAoyUAN COUNTY 333, TAIWAN



\* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。 \*  
(The tested sample / part is marked by an arrow if it's shown on the photo.)

### CE/2012/41404



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# 測試報告 Test Report

號碼(No.) : CE/2012/41405 日期(Date) : 2012/04/13 頁數(Page) : 1 of 4

幸亞電子工業股份有限公司

TY-OHM ELECTRONIC WORKS CO., LTD.

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NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAoyUAN COUNTY 333, TAIWAN



以下測試樣品係由客戶送樣，且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as):

樣品名稱(Sample Description) : CARBON FILM RESISTORS  
樣品型號(Style/Item No.) : RD SERIES  
收件日期(Sample Receiving Date) : 2012/04/07  
測試期間(Testing Period) : 2012/04/07 TO 2012/04/13

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

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

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# 測試報告

## Test Report

號碼(No.) : CE/2012/41405 日期(Date) : 2012/04/13 頁數(Page) : 2 of 4

幸亞電子工業股份有限公司

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NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN



### 測試結果(Test Results)

測試部位(PART NAME) No.1 : 整體混測 (MIXED ALL PARTS)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) No.1
鹵素 / Halogen				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析。 / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)			50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)			50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

### 備註(Note) :

1. mg/kg = ppm; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. 樣品的測試是基於申請人要求混合測試, 報告中的混合測試結果不代表其中個別單一材質的含量。(The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

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## 測試報告 Test Report

號碼(No.) : CE/2012/41405 日期(Date) : 2012/04/13 頁數(Page) : 3 of 4

幸亞電子工業股份有限公司

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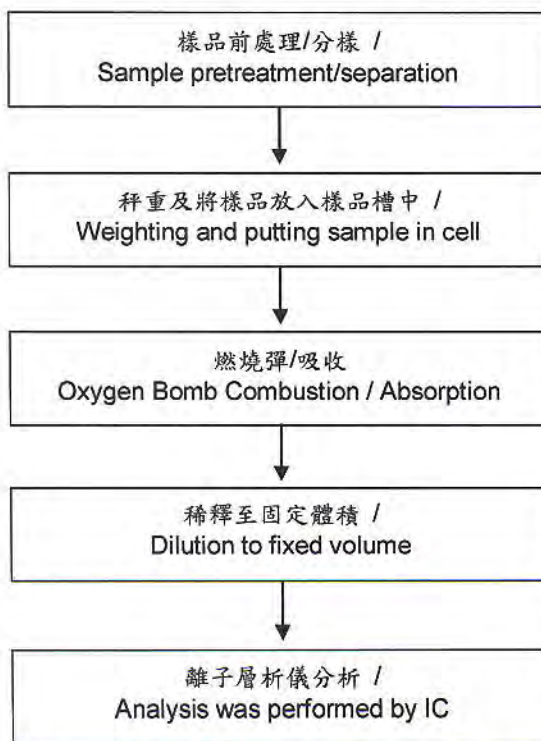
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### 鹵素分析流程圖 / Analytical flow chart of halogen content

- 測試人員：陳恩臻 / Name of the person who made measurement: Rita Chen
- 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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號碼(No.) : CE/2012/41405 日期(Date) : 2012/04/13 頁數(Page) : 4 of 4

幸亞電子工業股份有限公司

TY-OHM ELECTRONIC WORKS CO., LTD.

桃園縣龜山鄉頂湖一街49號

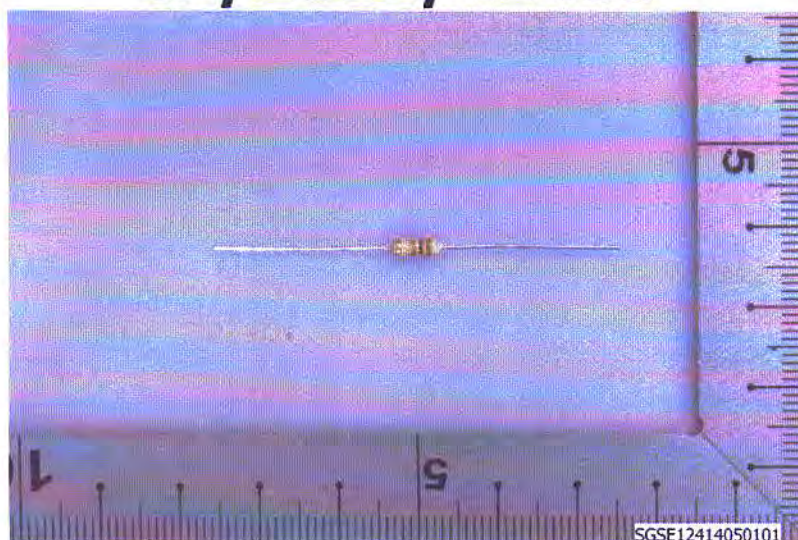
NO. 49, DINGFU 1st STREET, GUEISHAN TOWNSHIP, TAOYUAN COUNTY 333, TAIWAN



\* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。\*

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

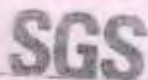
### CE/2012/41405



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# Test Report

No. GANE100203821

Date: 05 Jul 2012

Page 1 of 4

SHENZHEN GUANGTONG CITY METAL MATERIAL LIMITED COMPANY  
ALIAN INDUSTRIAL LONGGANG SHENZHEN  
GUANGDONG CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as:  
Copper-beryllium alloy rod 铜铍棒

SGS Job No.	10507527 - S2
Tested Sample Information	Copper-beryllium alloy rod 铜铍棒
SGS Internal Reference No.	2.1
Date of Sample Received	01 Jul 2012
Testing Period	01 Jul 2012 - 05 Jul 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 sample(s), the results comply with the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of  
SGS-CSTC Ltd.

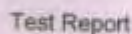
Silva Zhou  
Approved Signatory

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SGS (Shenzhen) Metal Materials Testing and Inspection Company Ltd. (SGS-CSTC)  
地址: 广东 - 深圳 - 龙岗区 - 坪地街道 - 坪地社区 - 坪地大道 - 1111号  
邮编: 518115 电话: 0755-21125555 / 0755-21125556 / 0755-21125557  
www.sgs.com.cn  
Member of the SGS Group (SBB SA)





Date: 05 Jul 2012

Page 2 of 4

**Test Results:**

10 for specimen 1

CAN10-02600-001

Description for specimen 1

Copper-catalyzed methyl ester

## RoHS Directive 2002/95/EC

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 61231:2008, ICP-OES	N.D.	2	700
Lead (Pb)	mg/kg	IEC 61231:2008, ICP-OES	26	2	1000
Mercury (Hg)	mg/kg	IEC 61231:2008, ICP-OES	N.D.	2	1000
Hexavalent Chromium (Cr(VI)) by boiling water extraction	-	IEC 61231:2008, UV-Vis	Negative	-	2

Publication:

1. mg/kg = ppm  
2. N.D. = Not Detected (< MDL)  
3. MDL = Method Detection Limit  
4. ⊖ = 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 CrVI oxides

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 cm<sup>2</sup> sample surface area.

Storage conditions and production date of the tested sample are unavoidable and thus results of Cr(VI) represent status of the sample at the time of testing.

5. # = Positive indicates the presence of CrVI on the tested areas  
Negative indicates the absence of CrVI on the tested areas  
6. - = Not regulated

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### ReHS Testing Flow Chart

- Statistical software: STATA 11.0 (StataCorp., 2009).



SGS authenticate the photo on original report only  
\*\*\* End of Report \*\*\*

[illegible][illegible]

Members of the IGC Group (IGC SA)

# TEST REPORT

NO.: A002R121008024-2R02

Date: Oct.10, 2012

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:** Oct. 08, 2012

**Testing period:** From Oct. 08, 2012 to Oct. 10, 2012

## Testing Requested

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2002/95/EC (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:

-\* 0.02 mg/kg refers to the MQL of sample extraction liquid.

## Conclusion:

-When tested as specified the submitted sample complied with the requirements of commission Decision of 18 Aug 2005 amending Directive 2002/95/EC notified under document 2005/618/EC.

\*\*\*\*\*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:

Wang Wexin, Weikin

Technical Director

Approved by:

Yuan Qi, Mickey

Lab Manager



# TEST REPORT

NO.: A002R121008024-2R02

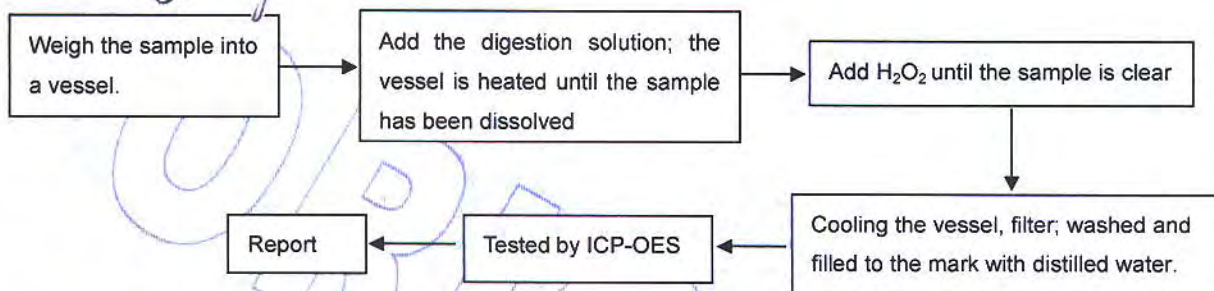
Date: Oct.10, 2012

Page 2 of 4

## Test Flow:

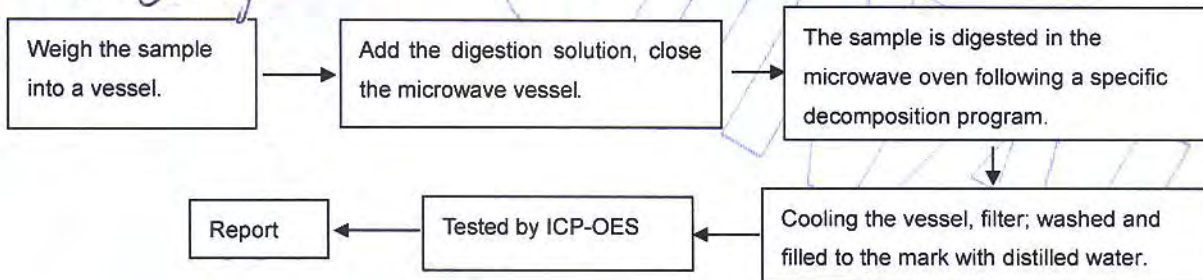
### 1. To Determine Lead, Cadmium Content: (Metal substrate)

Tested by: *Condy*



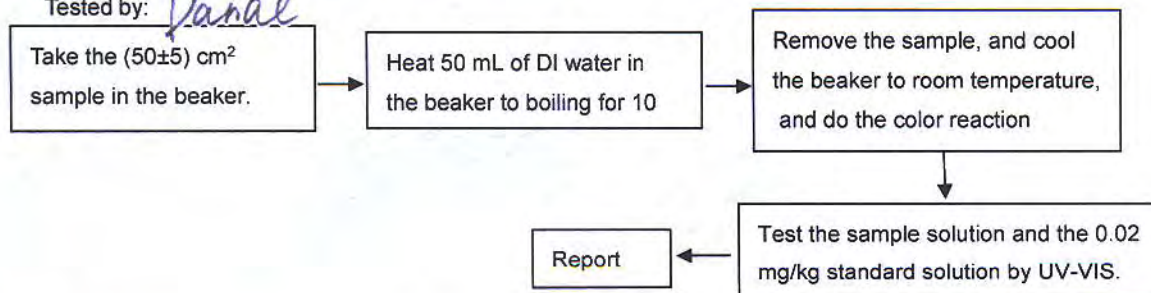
### 2. To Determine Mercury Content: (Metal substrate)

Tested by: *Condy*



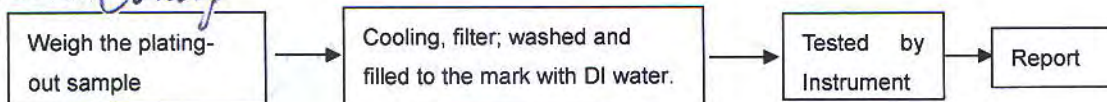
### 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate)

Tested by: *Danae*



### 4. To Determine Lead, Cadmium and Mercury Content: (Plating)

Tested by: *Condy*



# TEST REPORT

NO.: A002R121008024-2R02

Date: Oct.10, 2012

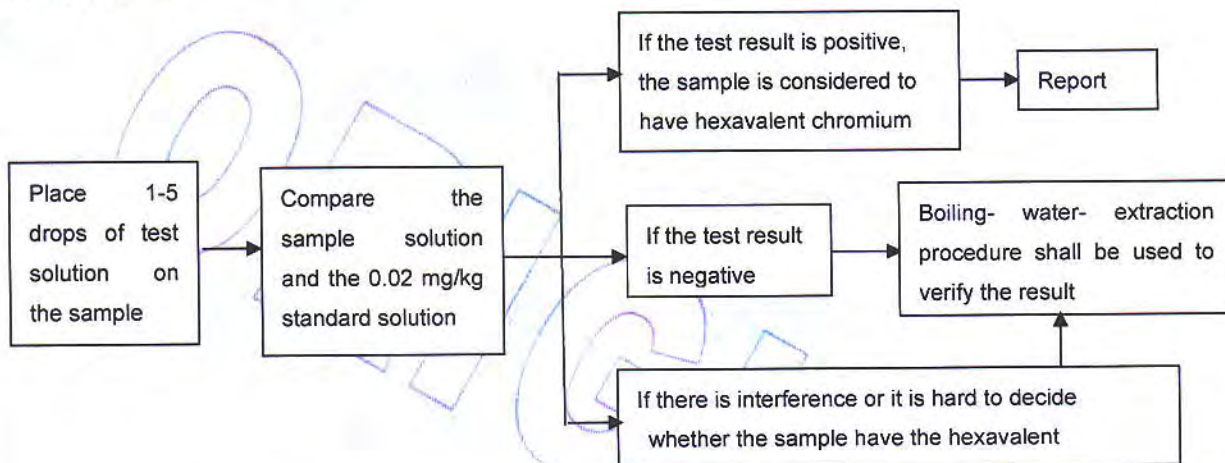
Page 3 of 4

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

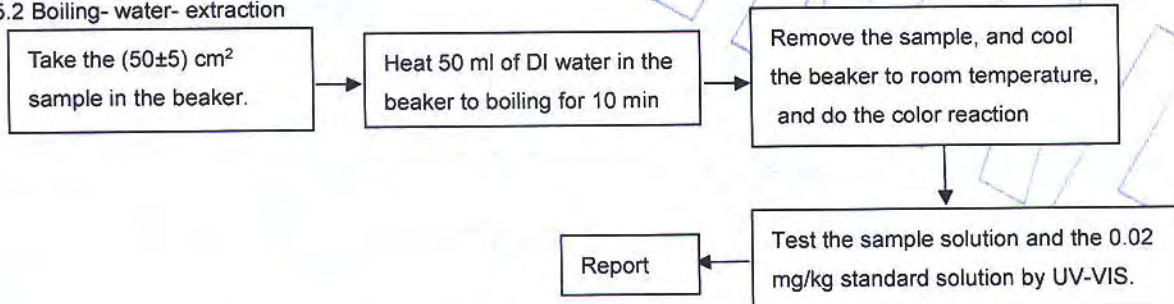
Tested by:

*Danae*

### 5.1 Spot-test



### 5.2 Boiling- water- extraction



### 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	Result			
			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



## TEST REPORT

NO.: A002R121008024-2R02

Date: Oct.10, 2012

Page 4 of 4

**Note:**

- The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.
- Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- mg/kg=ppm
- 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**



**Lead wire copper shell**

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





## Test Report

No. CANEC1208305601

Date: 02 Jul 2012

Page 1 of 5

AIM SOLDER (SHEN ZHEN) CO.,LTD.

BLOCK 69,THIRD INDUSTRIAL ZONE,LUOTIAN VILLAGE,SONGGANG TOWN,BAOAN DISTRICT,SZ  
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : SOLDER WIRE AIM230  
FAST CORE H RSA605

SGS Job No. : CP12-030363 - SZ

Date of Sample Received : 26 Jun 2012

Testing Period : 26 Jun 2012 - 02 Jul 2012

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

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

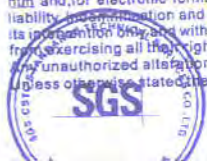
Test Results : Please refer to next page(s).

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.

Kenny Wang  
Approved Signatory

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## Test Report

No. CANEC1208305601

Date: 02 Jul 2012

Page 2 of 5

Test Results :

### Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN12-083056.001	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

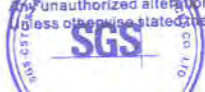
### RoHS Directive 2011/65/EU

Test Method : 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 Spot test / Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	78
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	-	-	◇	Negative
Sum of PBBs	1,000	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	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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## Test Report

No. CANEC1208305601

Date: 02 Jul 2012

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Test Item(s)	Limit	Unit	MDL	001
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 the directive 2011/65/EU, Annex II

(2) Spot-test:

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

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

Boiling-water-extraction:

Negative = Absence of CrVI coating

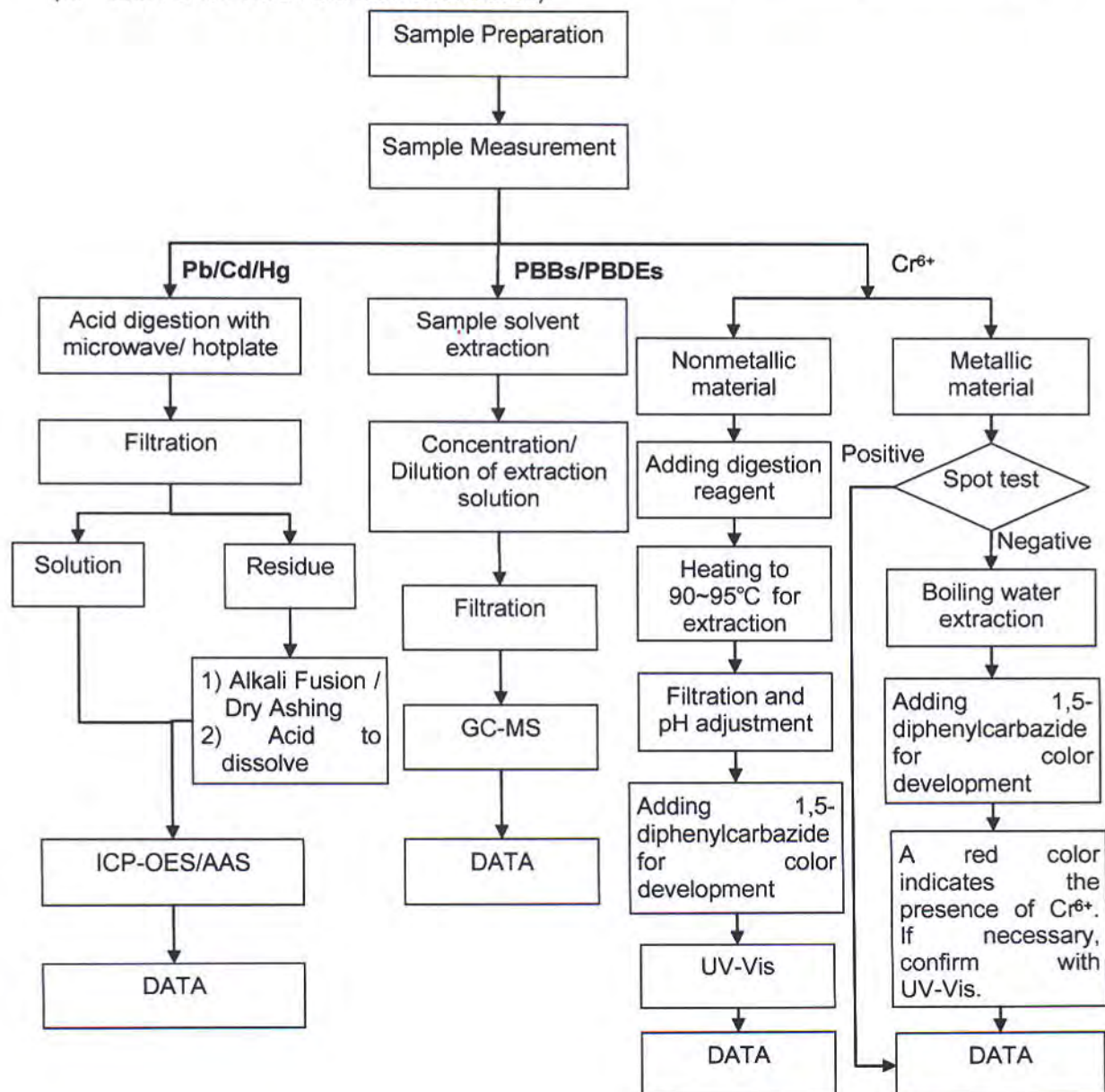
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

### ATTACHMENTS

#### RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang / Cutey Yu
- 2) Name of the person in charge of testing: Adams Yu / Ryan Yang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).





## Test Report

No. CANEC1208305601

Date: 02 Jul 2012

Page 5 of 5

Sample photo:



SGS authenticate the photo on original report only

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

## Test Report

No. CANEC1207912202

Date: 26 Jun 2012

Page 1 of 5

XIAMEN LICHUN ELECTRONIC ELEMENT CO.,LTD

42-2XINGLIN 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 : BOSI GLASS TUBE

SGS Job No. : XM13901119EC - XM

Date of Sample Received : 18 Jun 2012

Testing Period : 18 Jun 2012 - 26 Jun 2012

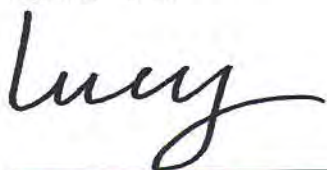
Test Requested : Selected test(s) as requested by client.

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.



Lucy Wu

Approved Signatory

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# Test Report

No. CANEC1207912202

Date: 26 Jun 2012

Page 2 of 5

Test Results :

## Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN12-079122.002	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

- (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)	Limit	Unit	MDL	002
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	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	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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## Test Report

No. CANEC1207912202

Date: 26 Jun 2012

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</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 the directive 2011/65/EU, Annex II

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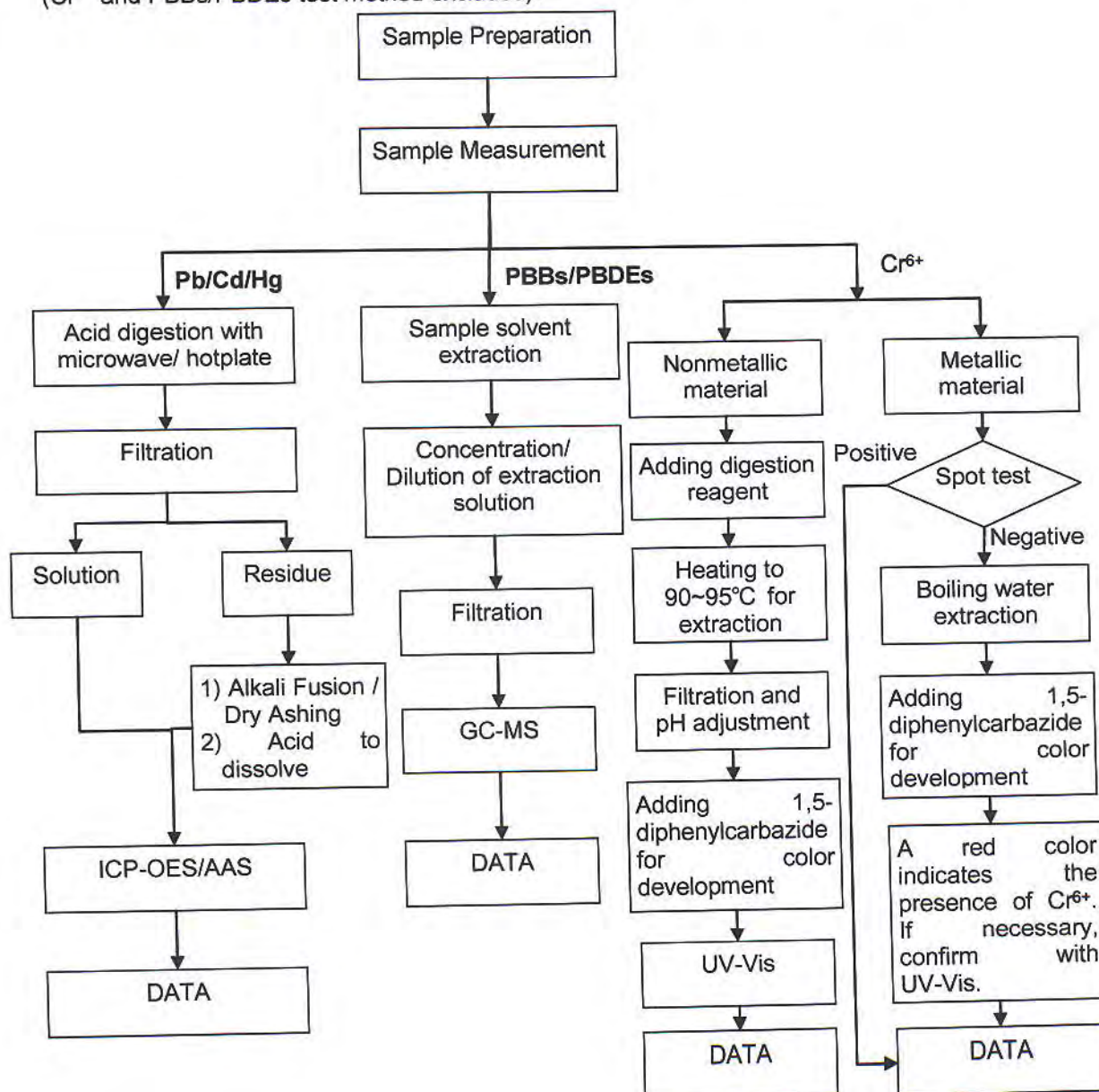
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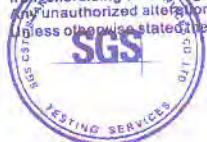
### ATTACHMENTS

#### RoHS Testing Flow Chart

- 1) Name of the person who made testing: Bella Wang / Cutey Yu
- 2) Name of the person in charge of testing: Adams Yu / Ryan Yang
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



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## Test Report

No. CANEC1207912202

Date: 26 Jun 2012

Page 5 of 5

Sample photo:



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Member of the SGS Group (SGS SA)



**TEST REPORT**

NUMBER: SHAH00345635

APPLICANT: LITTELFUSE, INC.  
800 E. NORTHWEST HWY  
ATTN: A.DIVIETRO/D.UNTIEDT

DATE: OCT 29, 2012

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **BLACK INK.**  
PART DESCRIPTION : INK-BLACK.  
PART NUMBER : 425902.  
DATE SAMPLE RECEIVED : OCTOBER.15, 2012.  
DATE TEST STARTED : OCTOBER.15, 2012.

\*\*\*\*\*

**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**

## 1 (I) Test Result Summary :

Testing Item	Result (ppm)
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
<b>Polybrominated Biphenyls (PBBs)</b>	
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
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>	
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

## (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 <sup>6+</sup> ) 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 analyte in sample

TO BE CONTINUED

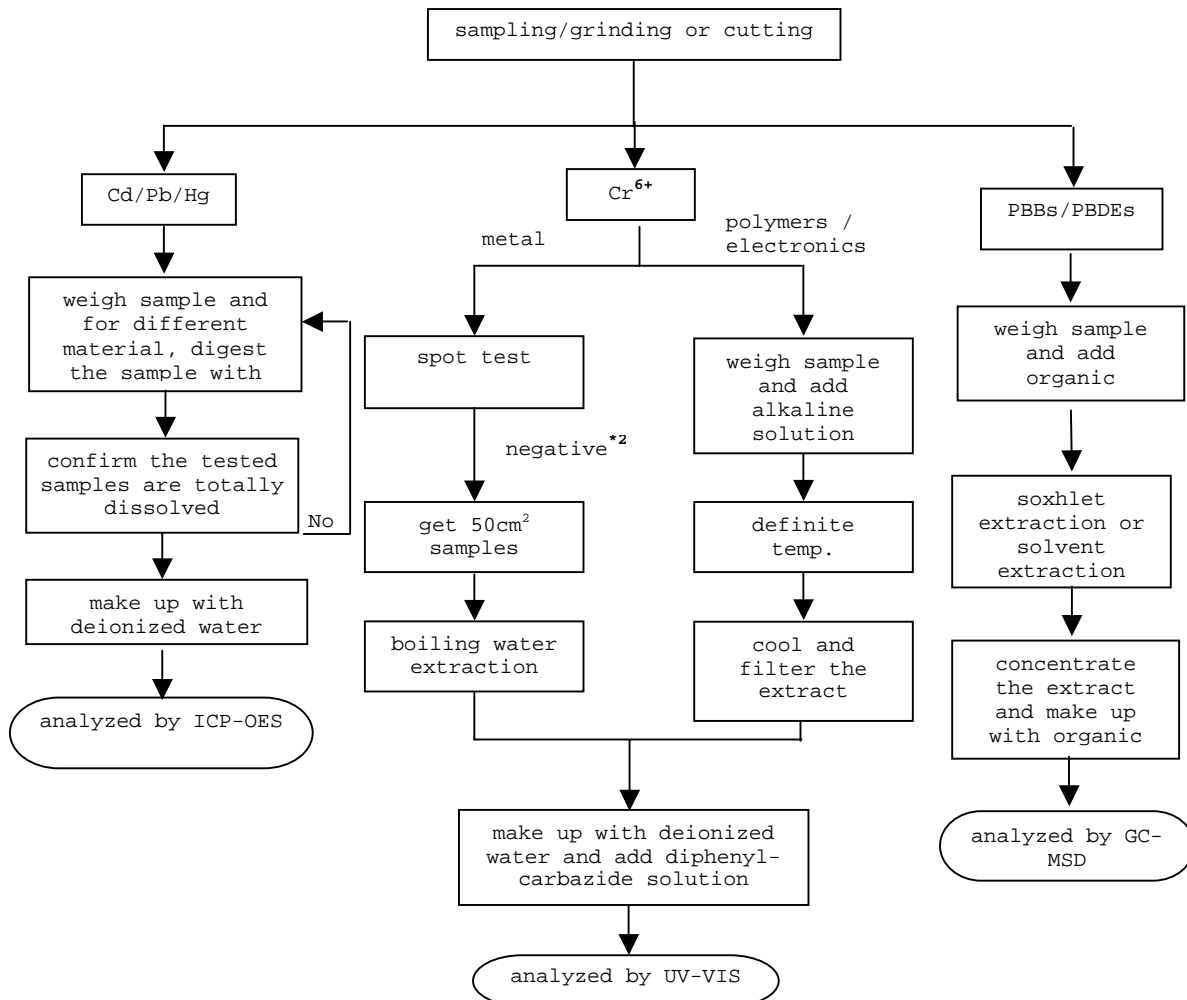


TESTS CONDUCTED

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (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 <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> ,HCl,HF
Electronics	HNO <sub>3</sub> ,HCl,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

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

\*\*\*\*\*

TO BE CONTINUED

**TEST REPORT**

NUMBER: SHAH00345635

## TESTS CONDUCTED

## 2 (I) Test Result Summary :

Testing Item	Result (ppm)
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	150
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million = mg/kg  
ND = Not detected

Responsibility Of Chemist : Leaf Liu

## (III) Test Method:

Testing Item	Testing Method	Reporting Limit
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 analyte in sample

\*\*\*\*\*  
TO BE CONTINUED**Intertek Testing Services Ltd., Shanghai**

Block B, Jinling Business Square, No.801 YiShan Road, Shanghai, China. 200233

上海天祥質量技術服務有限公司

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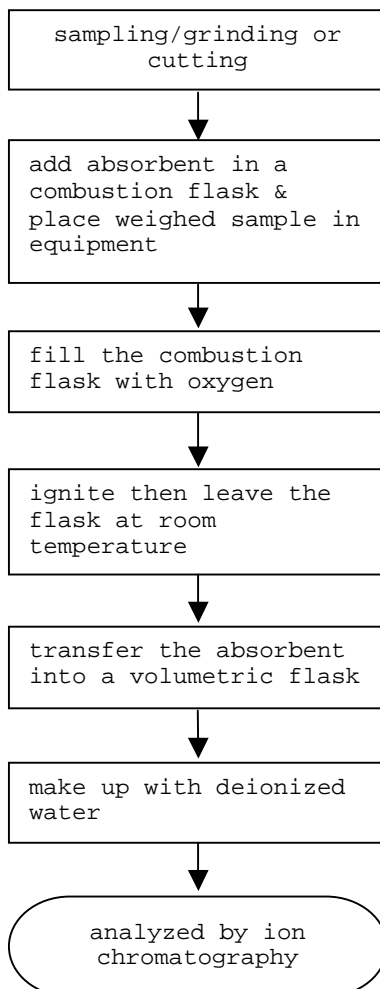
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TESTS CONDUCTED

(IV) Measurement Flowchart:

Test For Halogen Content  
Reference Standard: EN 14582



\*\*\*\*\*  
TO BE CONTINUED



**TEST REPORT**

NUMBER: SHAH00345635

TESTS CONDUCTED

3 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

REMARKS:

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

(B) TEST METHOD :

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm

\*\*\*\*\*  
TO BE CONTINUED

**Intertek Testing Services Ltd., Shanghai**

Block B, Jinling Business Square, No.801 YiShan Road, Shanghai, China. 200233

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Telephone: +86 21 6120 6060 Facsimile: +86 21 6127 9740

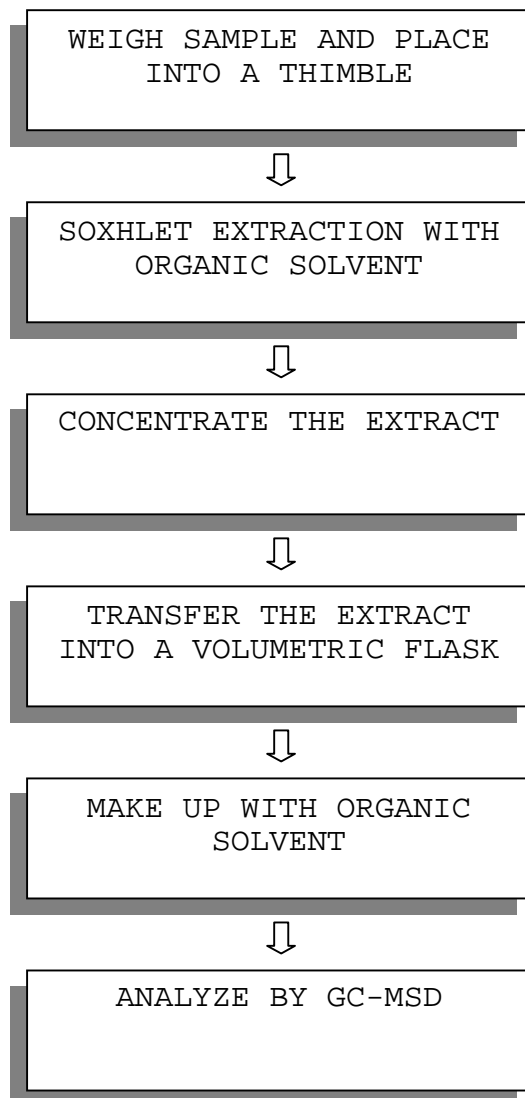
www.intertek.com www.intertek.com.cn



## TESTS CONDUCTED

MEASUREMENT FLOWCHART:

## TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

\*\*\*\*\*  
TO BE CONTINUED

TESTS CONDUCTED

4 PHthalate Content Test

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

<u>TESTED COMPOUND</u>	<u>RESULT (%W/W)</u>	<u>LIMIT(%W/W)</u> <u>(MAX.)</u>
DIBUTYL PHTHALATE (DBP)	ND	---
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	---
BENZYL BUTYL PHTHALATE (BBP)	ND	---
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH REGULATION (EC) NO. 1907/2006 & AMENDMENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)  
ND = NOT DETECTED

5 PHthalate Content Test

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

<u>TESTED COMPOUND</u>	<u>RESULT (%W/W)</u>	<u>LIMIT(%W/W)</u> <u>(MAX.)</u>
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)  
ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

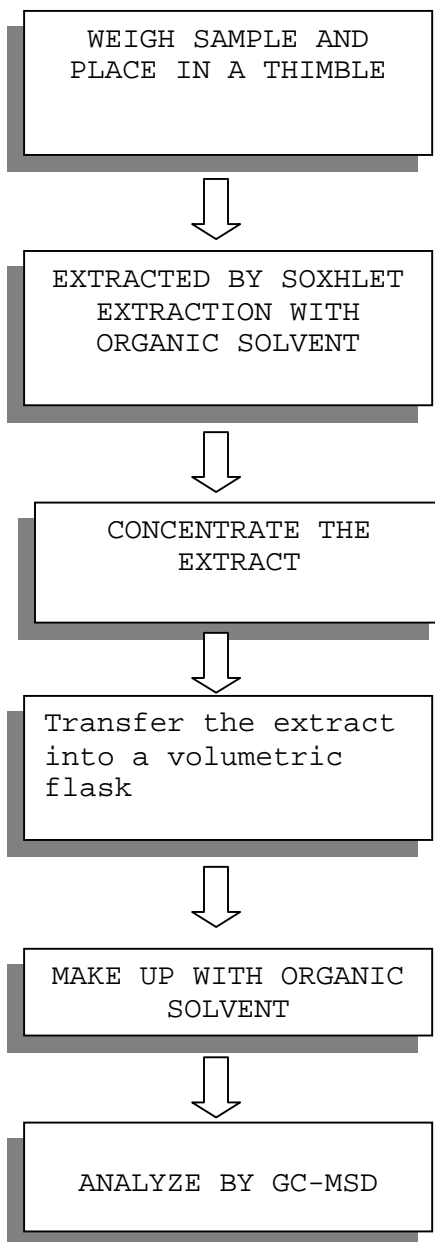
TESTING PERIOD : OCT.15, 2012 TO OCT.18, 2012

TO BE CONTINUED

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)

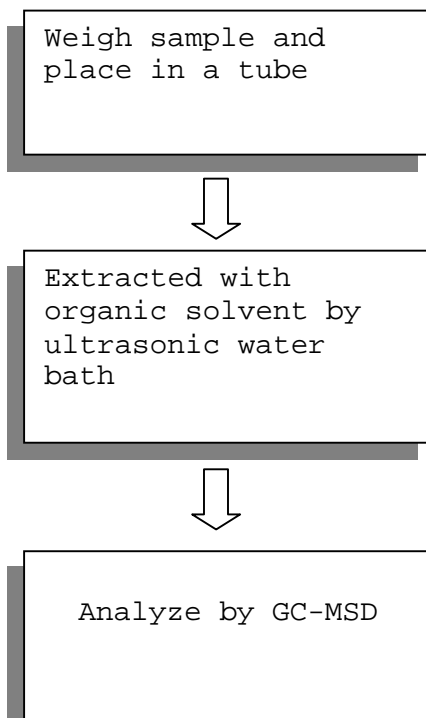


\*\*\*\*\*  
TO BE CONTINUED

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)



\*\*\*\*\*  
TO BE CONTINUED



## TESTS CONDUCTED



END OF REPORT

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**TEST REPORT**

NUMBER: SHAH00345432

APPLICANT: LITTELFUSE, INC.  
800 E. NORTHWEST HWY  
ATTN: A.DIVIETRO/D.UNTIEDT

DATE: OCT 29, 2012

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **BROWN INK.**  
PART DESCRIPTION : INK-BROWN.  
PART NUMBER : 425906.  
DATE SAMPLE RECEIVED : OCTOBER.15, 2012.  
DATE TEST STARTED : OCTOBER.15, 2012.

**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**

## 1 (I) Test Result Summary :

Testing Item	Result (ppm)
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
<b>Polybrominated Biphenyls (PBBs)</b>	
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
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>	
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

## (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 <sup>6+</sup> ) 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 analyte in sample

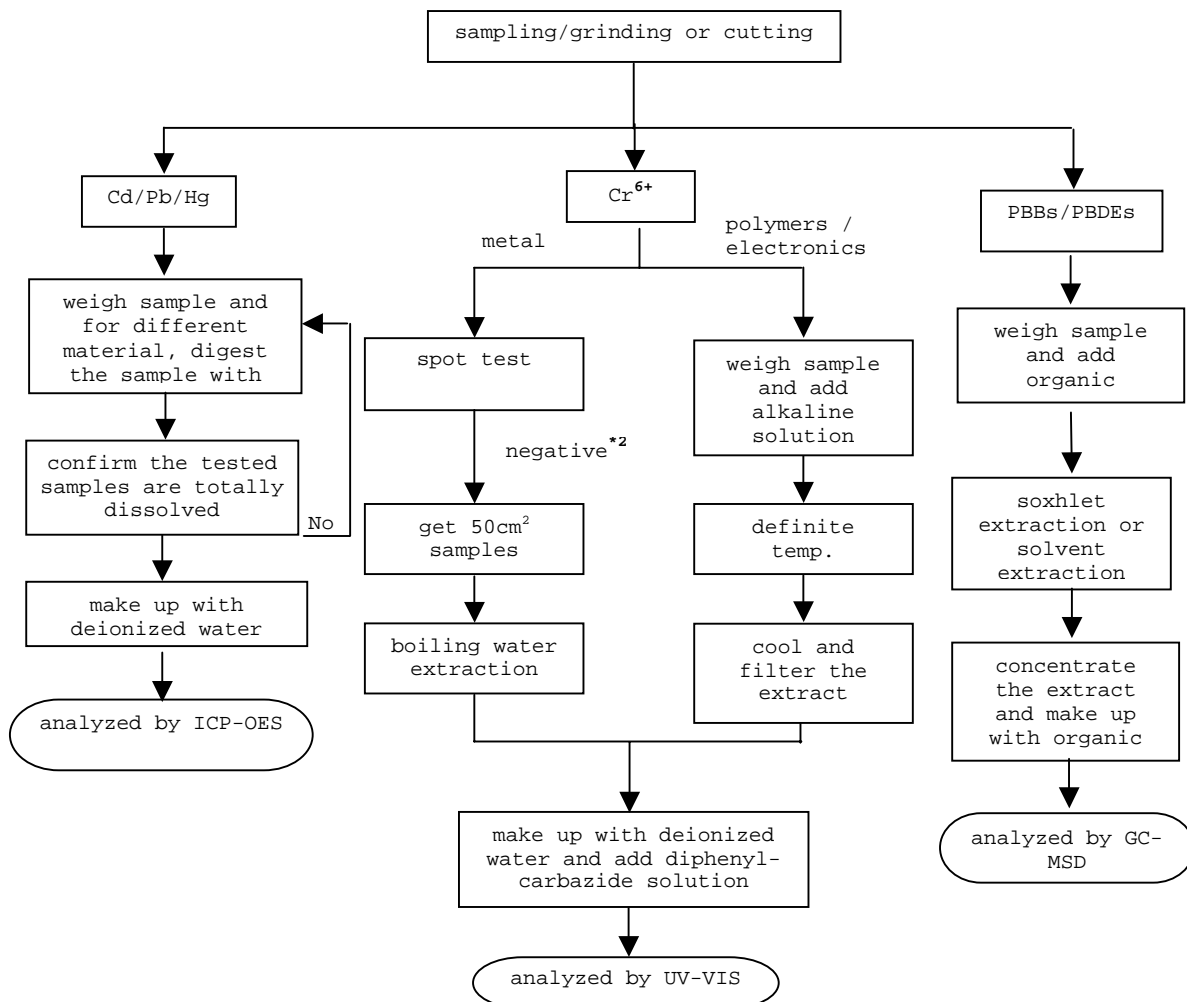
TO BE CONTINUED

**TESTS CONDUCTED**

## (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (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 <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

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

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TO BE CONTINUED



**TEST REPORT**

NUMBER: SHAH00345432

## TESTS CONDUCTED

## 2 ( I ) Test Result Summary :

<u>Testing Item</u>	<u>Result (ppm)</u>
<b>Halogen Content</b>	
Fluorine (F)	ND
Chlorine (Cl)	8600
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million = mg/kg  
ND = Not detected

Responsibility Of Chemist : Leaf Liu

## (III) Test Method:

<u>Testing Item</u>	<u>Testing Method</u>	<u>Reporting Limit</u>
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 analyte in sample

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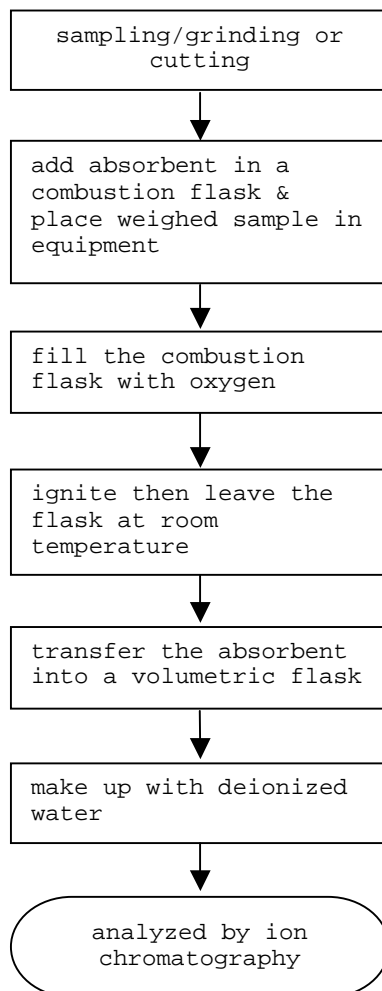
TO BE CONTINUED

**TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content

Reference Standard: EN 14582



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TO BE CONTINUED

## TESTS CONDUCTED

## 3 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

## REMARKS:

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

## (B) TEST METHOD :

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm

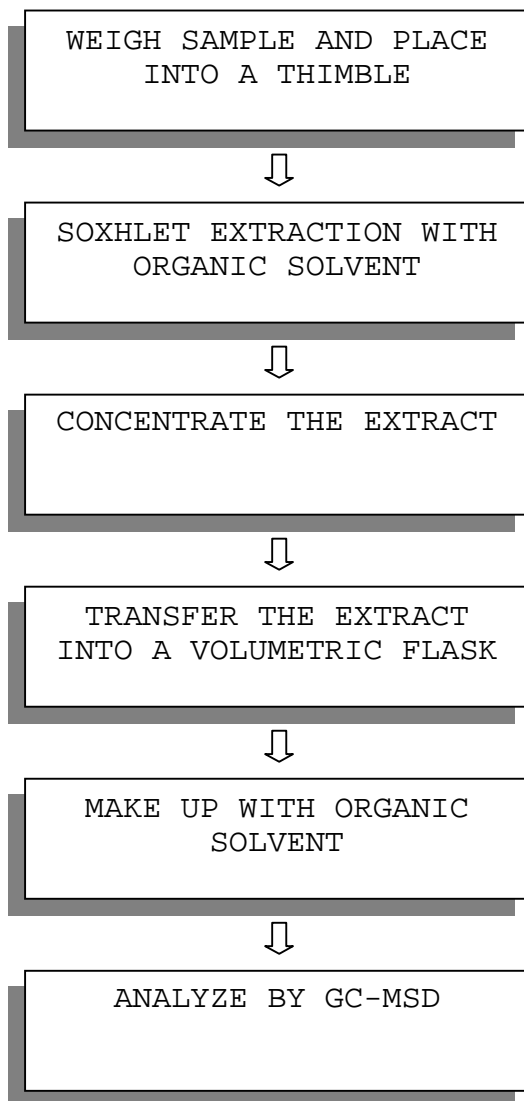
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TO BE CONTINUED

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT



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TO BE CONTINUED



TESTS CONDUCTED

4 PHthalate Content Test

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

<u>TESTED COMPOUND</u>	<u>RESULT (%W/W)</u>	<u>LIMIT(%W/W)</u> <u>(MAX.)</u>
DIBUTYL PHTHALATE (DBP)	ND	---
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	---
BENZYL BUTYL PHTHALATE (BBP)	ND	---
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH REGULATION (EC) NO. 1907/2006 & AMENDMENT NO.552/2009 (FORMERLY KNOWN AS DIRECTIVE 2005/84/EC) FOR PHTHALATE CONTENT IN TOYS AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)  
ND = NOT DETECTED

5 PHthalate Content Test

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

<u>TESTED COMPOUND</u>	<u>RESULT (%W/W)</u>	<u>LIMIT(%W/W)</u> <u>(MAX.)</u>
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY IMPROVEMENT ACT 2008 FOR PROHIBITION ON SALE OF CERTAIN PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)  
ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

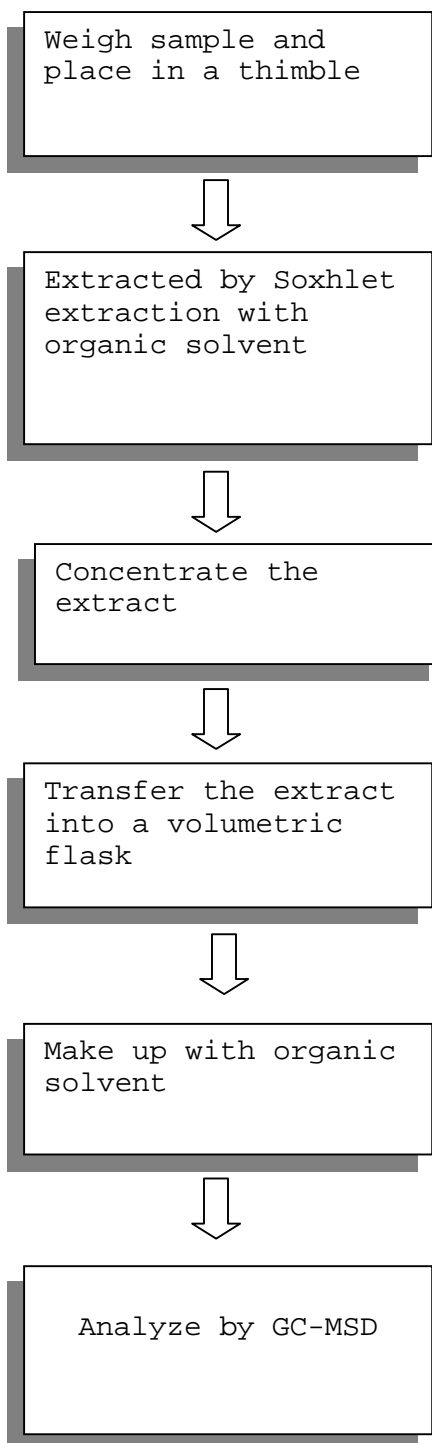
TESTING PERIOD: OCT.15, 2012 TO OCT.23, 2012

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TO BE CONTINUED

TESTS CONDUCTED  
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)

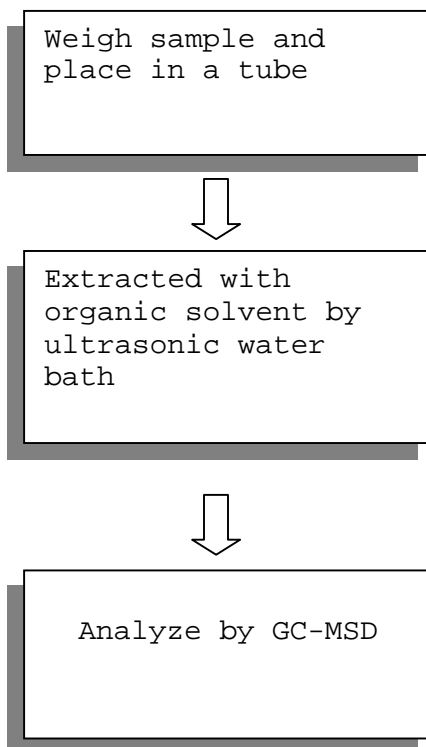


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TO BE CONTINUED

TESTS CONDUCTED  
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)



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TO BE CONTINUED

TESTS CONDUCTED



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END OF REPORT

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