ICP Test Report Certification Packet

Company name: Littelfuse, Inc.

Product Series: 5x20 Cartridge Fuse

Product #: 219XAEP Series

Issue Date: March 5, 2014

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

Issued by: JORDANUFF H. CABILAN

[Global EHS Engineer]

(1) Parts, sub-materials and unit parts

This document covers the 5x20 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 identifed in Table 1

Remarks :

Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	937-07x	Cap with Lead	3-6
2	087355	Glue	7-17
3	692529	Solder	18-22
4	082xxx-001	Wire Tin plated Cu	23-26
5	6872xx-001	Wire Sn plated AgCu	27-32
6	648901	Yarn	33-38
7	648115	Yarn	39-44
8	648150	Yarn	45-50
9	648118	Yarn	51-62
10	692535-002	Solder	63-68
11	692539-002	Solder	69-74
12	910-555_ C910510	Cap	75-78
13	C909542	Body	79-83
14	C909543_ C909529	Body	84-88

TEST REPORT

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

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

Report on the submitted sample said to be

Sample name: Lead wire copper shell

Model: /

Item/Lot No.: /

Material: /

Buyer: /

Supplier: /

Manufacturer: /

Sample received date: Apr.03, 2013

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

Testing Requested

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

Testing method:

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

Note:

-* 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 Directive 2011/65/EU (RoHS).

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

Signed for and on behalf of

Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

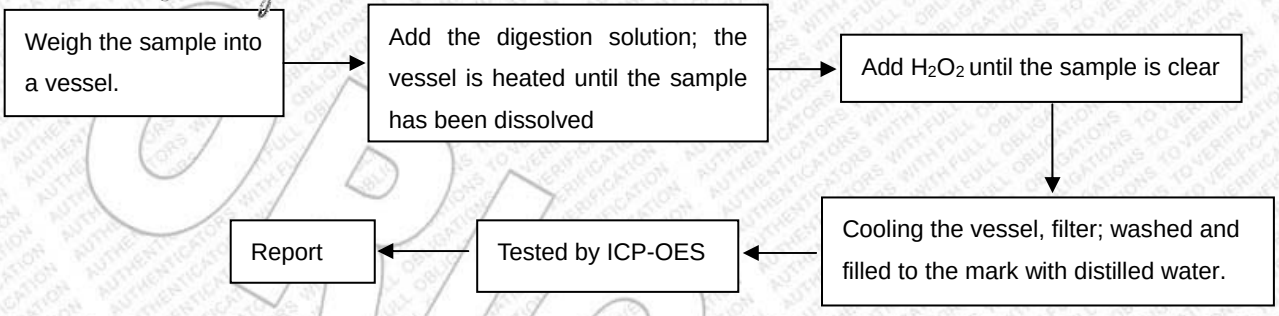
Project Leader: Maggie	Reviewed by: Weikin	Approved by: Mickey
Li Tingting, Maggie	Wang Wexin, Weikin	Yuan Qi, Mickey
Chemical Test Director	Technical Director	Lab Manager

TEST REPORT

Test Flow:

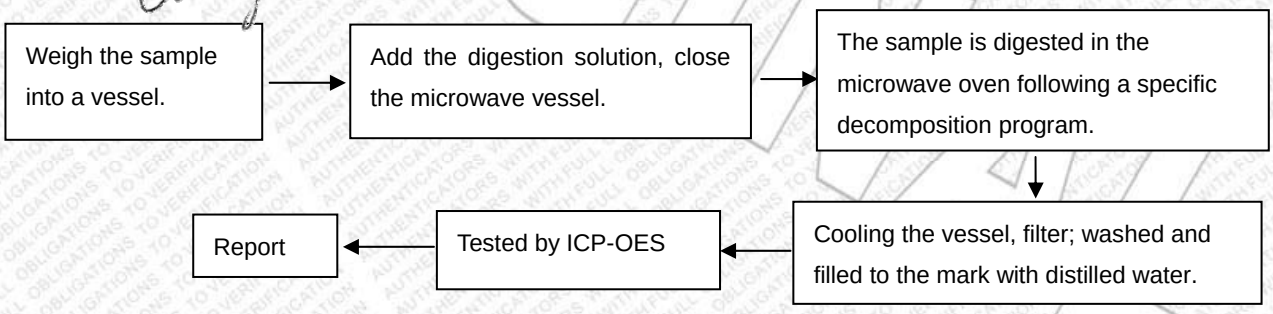
1. To Determine Lead, Cadmium Content: (Metal substrate)

Tested by: Condy



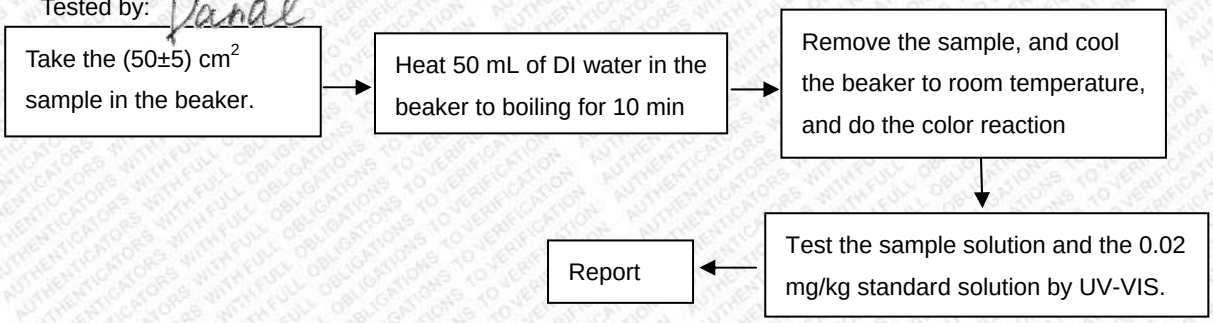
2. To Determine Mercury Content: (Metal substrate)

Tested by: Condy



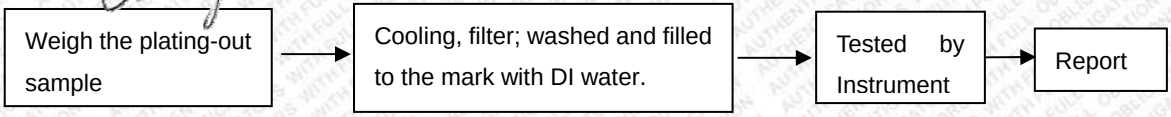
3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate)

Tested by: Danal



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

Tested by: Condy

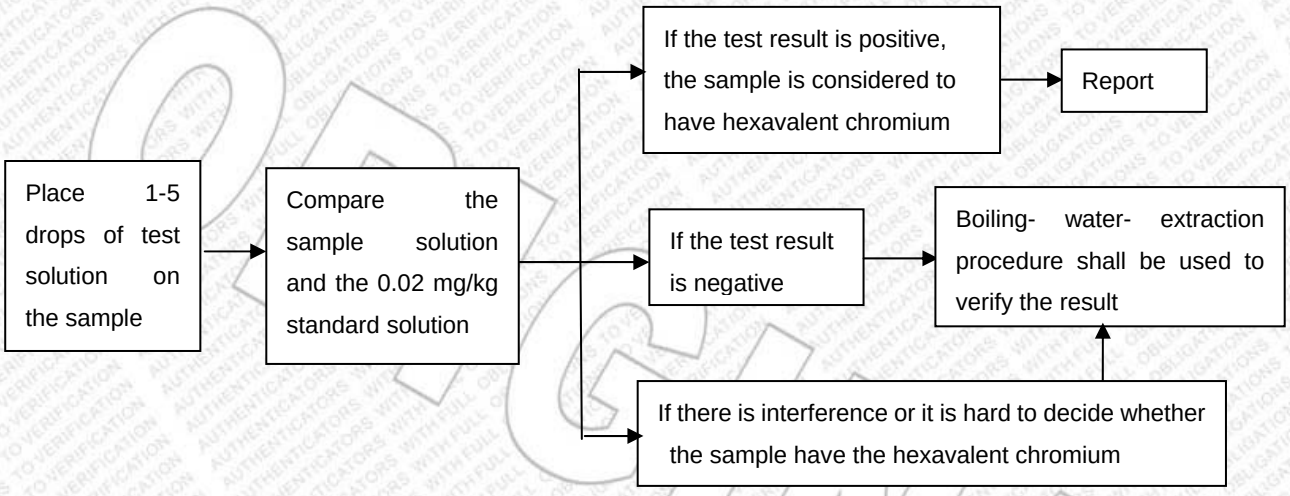


TEST REPORT

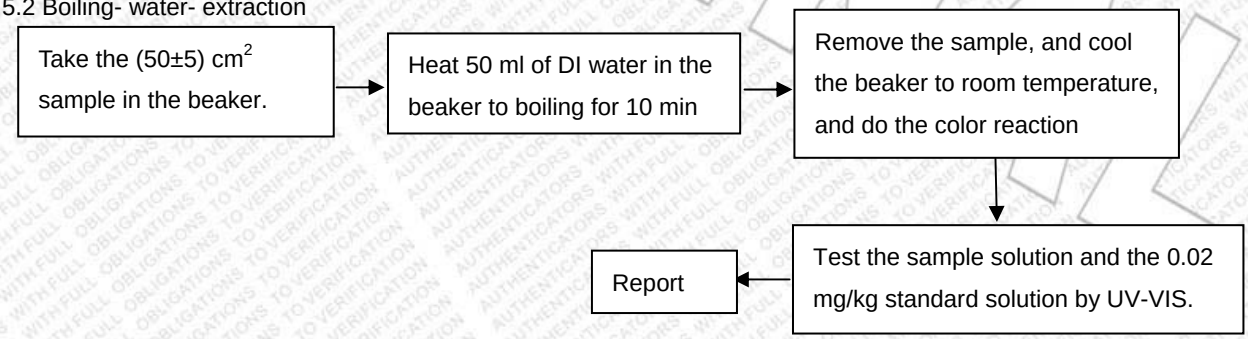
5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating)

Tested by: Danal

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

Note:

-Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.

-N.D.=not detected(<MQL)

-MQL=Method Quantitation Limit

-Negative=Absence of Cr (Ⅵ);

-Positive=Presence of Cr (Ⅵ);

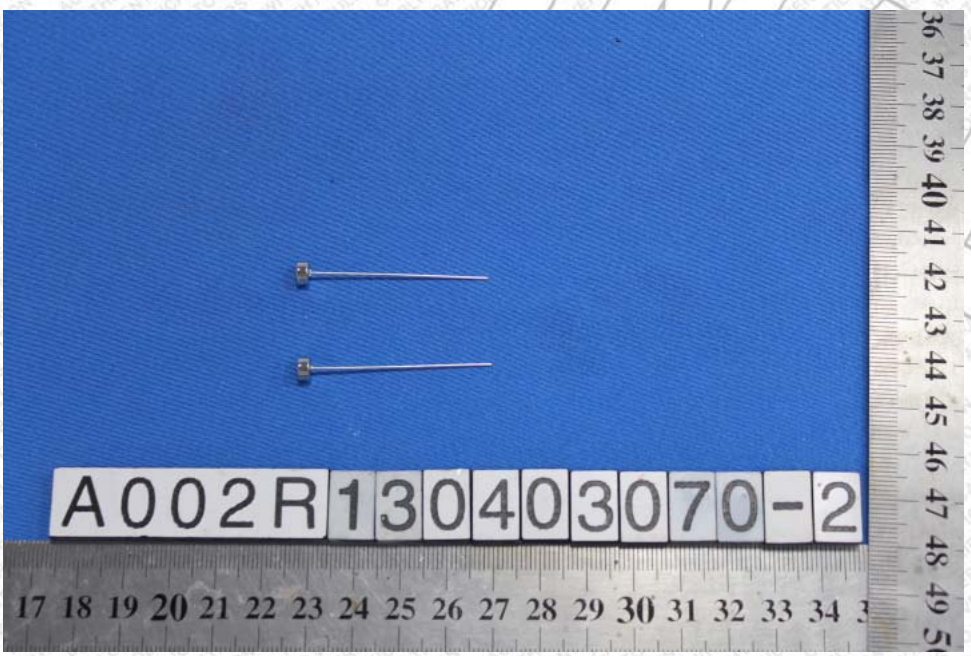
Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.

（The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.）

-**The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.

-Photo is included

Photograph of Sample



Lead wire copper shell

End of Report

CTI 华测检测 CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000103890001

Applicant BEIJING HYSTIC NEW MATERIALS CO., LTD.
Address 5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE,BEIJING. 100041, CHINA.

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

Sample Name	EPOXY ADHESIVE
Part No.	EP608
Customer Reference Information	EP625, EP652, EP425, EP162, EP162L, EP209, EP210, EP211, EP229, EP313, EP315, EP100-EP199, EP200-EP299, EP300-EP399, EP400-EP499, EP500-EP599, EP600-EP699
Sample Received Date	May. 6, 2013
Testing Period	May. 6, 2013 to May. 8, 2013
Test Requested	As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs) in the submitted sample(s).
Test Method	Please refer to the following page(s).
Test Result(s)	Please refer to the following page(s).

****

Conclusion

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

****

*2011/65/EU is a new version of RoHS Directive (2002/95/EC), which focuses on restriction of the use of certain hazardous substances (Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers(PBDEs))in electrical and electronic equipment.
Pass means that the results shown on the report do not exceed the limits set by RoHS Directive 2011/65/EU.

Tested by Rex Li

Approved by Allen Wang

Allen Wang
Technical Manager

Reviewed by Andy Chang

Date May. 8, 2013

No. 1428692328

Centre Testing International (Tianjin) Co., Ltd. No.99, Xianfeng East Road, Dongli District, Tianjin, China

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000103890001

Test Method

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

Test Result(s)

Tested Item(s)	**Result**	**MDL**	**Limit of Directive 2011/65/EU**
Lead(Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D.	2 mg/kg	1000 mg/kg

Tested Item(s)	**Result**	**MDL**	**Limit of Directive 2011/65/EU**
Polybrominated Biphenyls(PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	1000 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg	
Tribromobiphenyl	N.D.	5 mg/kg	
Tetrabromobiphenyl	N.D.	5 mg/kg	
Pentabromobiphenyl	N.D.	5 mg/kg	
Hexabromobiphenyl	N.D.	5 mg/kg	
Heptabromobiphenyl	N.D.	5 mg/kg	
Octabromobiphenyl	N.D.	5 mg/kg	
Nonabromobiphenyl	N.D.	5 mg/kg	
Decabromobiphenyl	N.D.	5 mg/kg	

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Tested Item(s)	Result	MDL	Limit of Directive 2011/65/EU
Polybrominated Diphenyl Ethers(PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg	
Tribromodiphenyl ether	N.D.	5 mg/kg	
Tetrabromodiphenyl ether	N.D.	5 mg/kg	
Pentabromodiphenyl ether	N.D.	5 mg/kg	
Hexabromodiphenyl ether	N.D.	5 mg/kg	
Heptabromodiphenyl ether	N.D.	5 mg/kg	
Octabromodiphenyl ether	N.D.	5 mg/kg	
Nonabromodiphenyl ether	N.D.	5 mg/kg	
Decabromodiphenyl ether	N.D.	5 mg/kg	

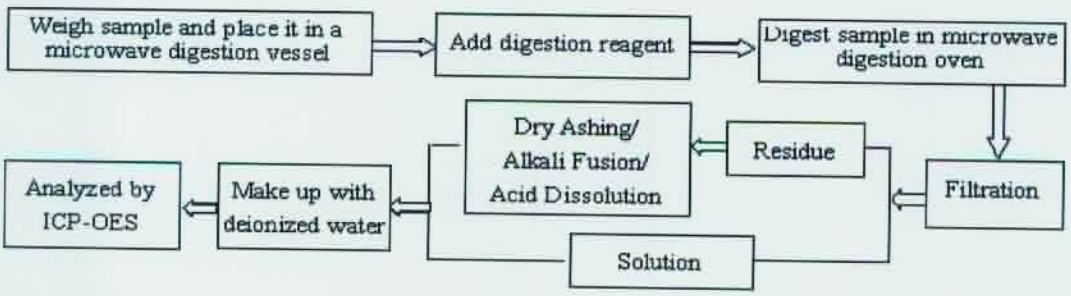
Tested Sample/Part Description Light yellow liquid

Note: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million

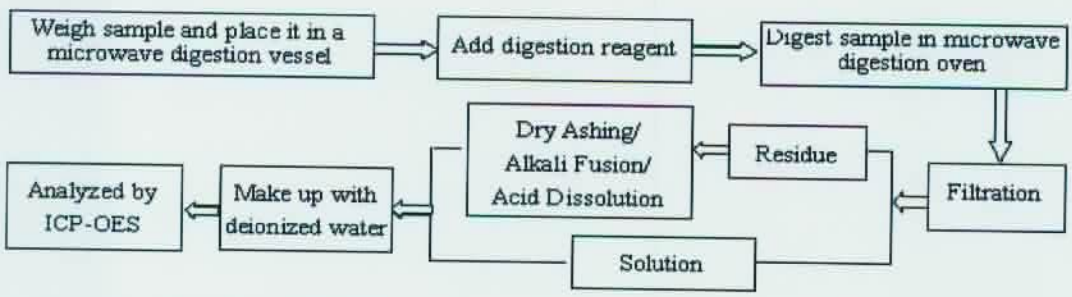
Test Report

Test Process

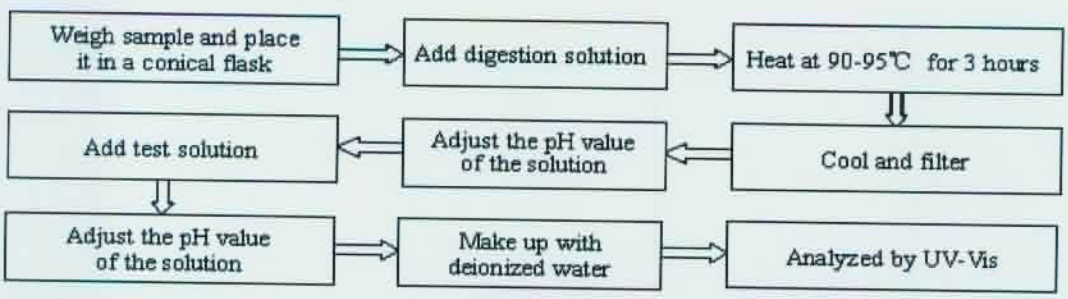
1. **Lead(Pb), Cadmium(Cd)**



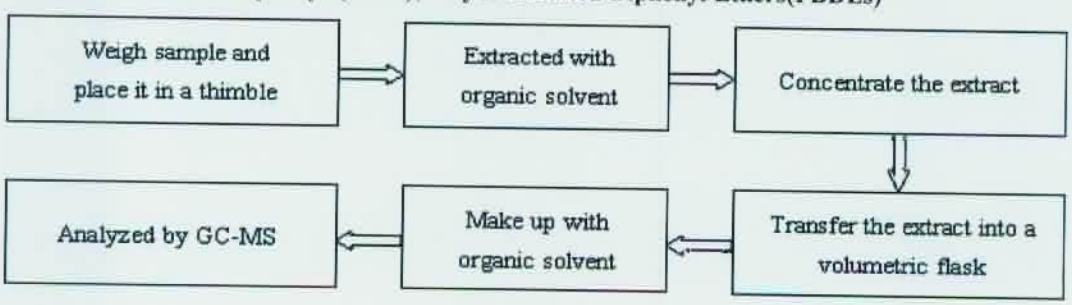
2. **Mercury(Hg)**



3. **Hexavalent Chromium(Cr(VI))**



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



Test Report

Report No. RLTJF000103890001

Photo(s) of the sample(s)

*** End of report ***

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

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000102620001

Applicant BEIJING HYSTIC NEW MATERIALS CO., LTD.
Address 5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE,BEIJING. 100041, CHINA.

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

Sample Name	EPOXY ADHESIVE
Part No.	EP608
Customer Reference Information	EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313, EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499, EP500-EP599,EP600-EP699
Sample Received Date	Apr. 19, 2013
Testing Period	Apr. 19, 2013 to Apr. 24, 2013

Test Requested As specified by client, to test Dibutyl phthalate(DBP), Benzyl butyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP), Hexabromocyclododecane (HBCDD) in the submitted sample(s).

Test Method

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

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

Tested by Rex Li
Approved by Allen Wang
Allen Wang
Technical Manager
Centre Testing International (Tianjin) Co., Ltd.

CENTRE TESTING INTERNATIONAL CTI TJ03

Reviewed by Andy Chang
Date Apr. 24, 2013

No. 1428612964

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

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000102620001

Test Result(s)

Tested Item(s)	Result	MDL
Hexabromocyclododecane (HBCDD)	N.D.	5 mg/kg

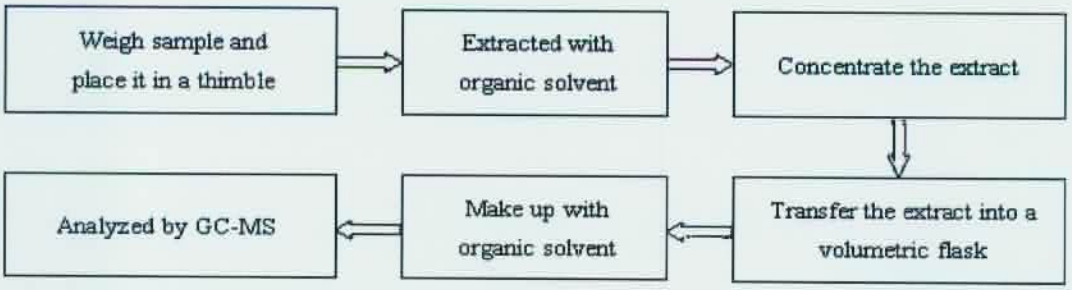
Tested Item(s)	Result	MDL
Phthalate		
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg
Benzyl butyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-2-ethylhexyl phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg

Tested Sample/Part Description Light yellow liquid

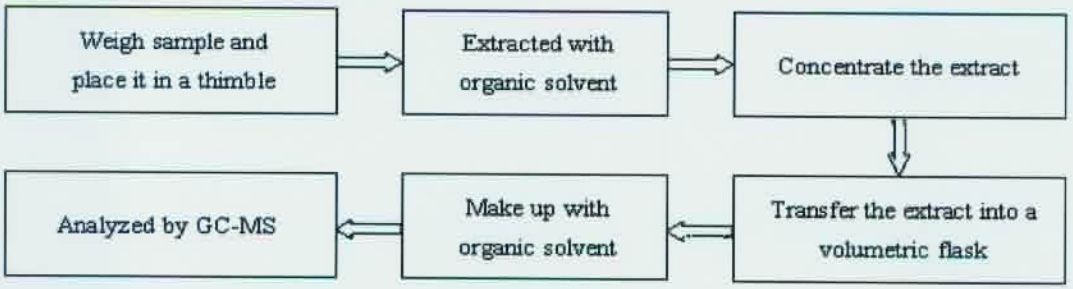
Note: -MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million

Test Process

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



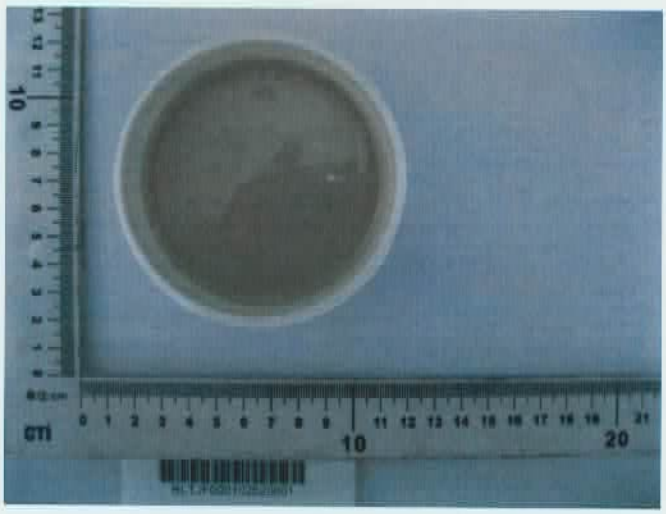
2. **Hexabromocyclododecane (HBCDD)**



Test Report

Report No. RLTJF000102620001

Photo(s) of the sample(s)



*** End of report ***

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000102620002

Applicant BEIJING HYSTIC NEW MATERIALS CO., LTD.
Address 5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE,BEIJING. 100041, CHINA.

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

Sample Name	EPOXY ADHESIVE
Part No.	EP608
Customer Reference Information	EP625,EP652,EP425,EP162,EP162L,EP209,EP210,EP211,EP229,EP313, EP315,EP100-EP199,EP200-EP299,EP300-EP399,EP400-EP499, EP500-EP599,EP600-EP699
Sample Received Date	Apr. 19, 2013
Testing Period	Apr. 19, 2013 to Apr. 24, 2013

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

Test Method

Test Item(s)	Test Method	Measured Equipment(s)
Fluorine(F)	Refer to BS EN 14582:2007	IC
Chlorine(Cl)	Refer to BS EN 14582:2007	IC
Bromine(Br)	Refer to BS EN 14582:2007	IC
Iodine(I)	Refer to BS EN 14582:2007	IC

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

Tested by Liu

Approved by Allen Wang

Allen Wang
Technical Manager

Reviewed by Andy Chang

Date Apr. 24, 2013

No. 1428612964

Centre Testing International (Tianjin) Co., Ltd. No.99, Xianfeng East Road, Dongli District, Tianjin, China

CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000102620002

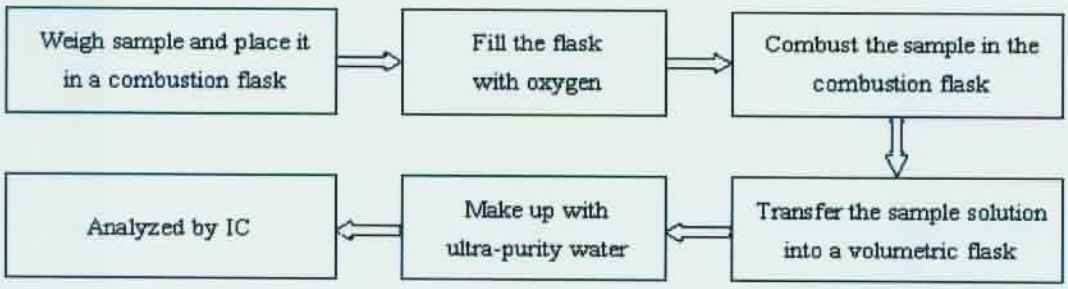
Test Result(s)

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

Tested Sample/Part Description Light yellow liquid

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

Test Process



CTI 华测检测
CENTRE TESTING INTERNATIONAL

Test Report

Report No. RLTJF000102620002

Photo(s) of the sample(s)

*** End of report ***

LITTELFUSE PHILIPPINES INC.
LIMA TECHNOLOGY CENTER, LIPA CITY,
MALVAR, BATANGAS

THIS REPORT IS TO SUPERSEDE TEST REPORT NO.SHAEC1317518837, DATE:2013/09/06.

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

SGS Job No. :	SP13-026309 - SH
Model No. :	YTW206(692529)
Composition :	Sn0.3Ag0.7CuCe
Date of Sample Received :	03 Sep 2013
Testing Period :	03 Sep 2013 - 06 Sep 2013
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

JJ Fan
Approved Signatory

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA13-175188.032	Silvery metal wire

Remarks :

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

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

Test Item(s)	Limit	Unit	MDL	*032*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	40
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

SGS-CSTC Standards Technical Services (Shanghai) Co.,Ltd. Testing Centre
3rd Building,No.889 Yishan Road Xuhui District,Shanghai China 200233
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HL: (86-21) 61402594 HL: (86-21)54500353 e sgs.china@sgs.com

Test Item(s)	Limit	Unit	MDL	*032*
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

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

(2) ◇Spot-test:
Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;
(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)
◇Boiling-water-extraction:
Negative = Absence of Cr(VI) coating
Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.
Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

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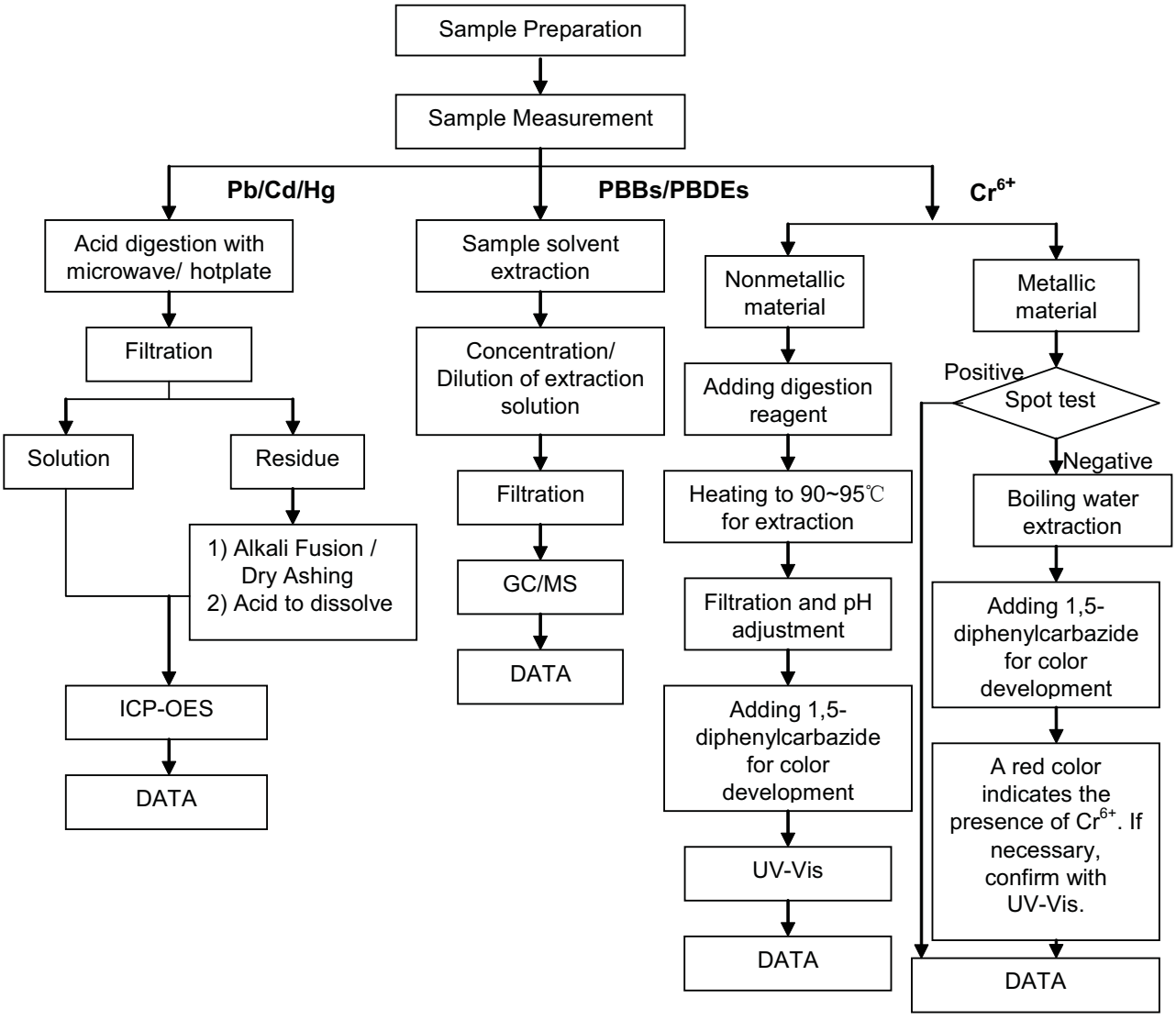
t E&E (86-21) 61402553 f E&E (86-21)64953679 www.cn.sgs.com
HL: (86-21) 61402594 HL: (86-21)54500353 e sgs.china@sgs.com

ATTACHMENTS

RoHS Testing Flow Chart

1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



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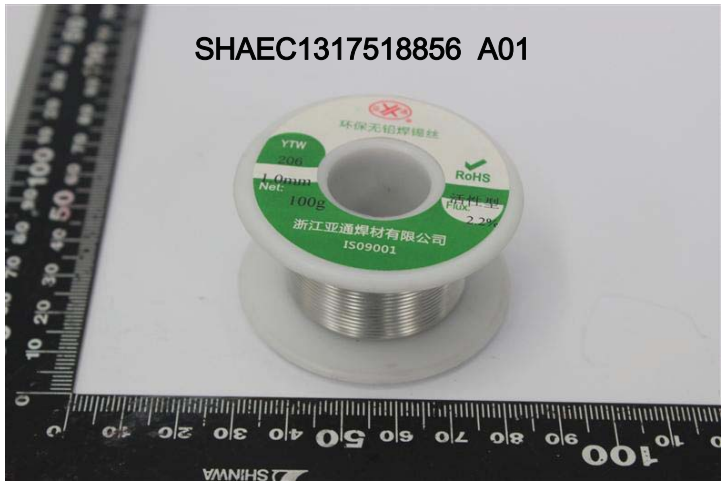
Sample photo:



SHA13-175188.032

SGS authenticate the photo on original report only

*** End of Report ***

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Intertek Consumer Goods GmbH · Würzburger Straße 152 · 90766 Fürth · Germany

Littelfuse Philippines Inc.
Arsenio M. Cesista Jr.
LIMA Technology Center, SEZ

4233 Malvar / Batangas

Fürth, 2013-12-17

Test report No. FUHLP2013-3898

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

Sample description: **Cu99.9MSn**

Arrival in lab: 2013-12-02; Period of analysis: 2013-12-04 – 2013-12-13
Head of Inorganic Lab: Claudia List

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	**pass°**

° Please see overview of test results

- Test results see next pages -

Sample description: Cu99.9MSn

nM = non Metal
M = Metal
cM = composite Material

List of component parts:

Sample No.	Part No.	Material	Description
334031	**1**	M	Tinned copper wire

Photo:

Sample No.
334031
Part No. 1

Analysis of metals by ICP-MS, results in mg/kg

Method: Pb, Cd, Cr: DIN EN ISO 17294-2**
Digestion: with conc. HNO_3 + HCl**
Detection limit: Pb 5.0 mg/kg, Cd 1.0 mg/kg, Cr 10 mg/kg, Hg: 0.5 mg/kg

Sample No.	Part No.	Pb	Hg	Cd	Cr_{total}
334031	**1**	50	<0.5	<1.0	<10

Status
pass

Comment:

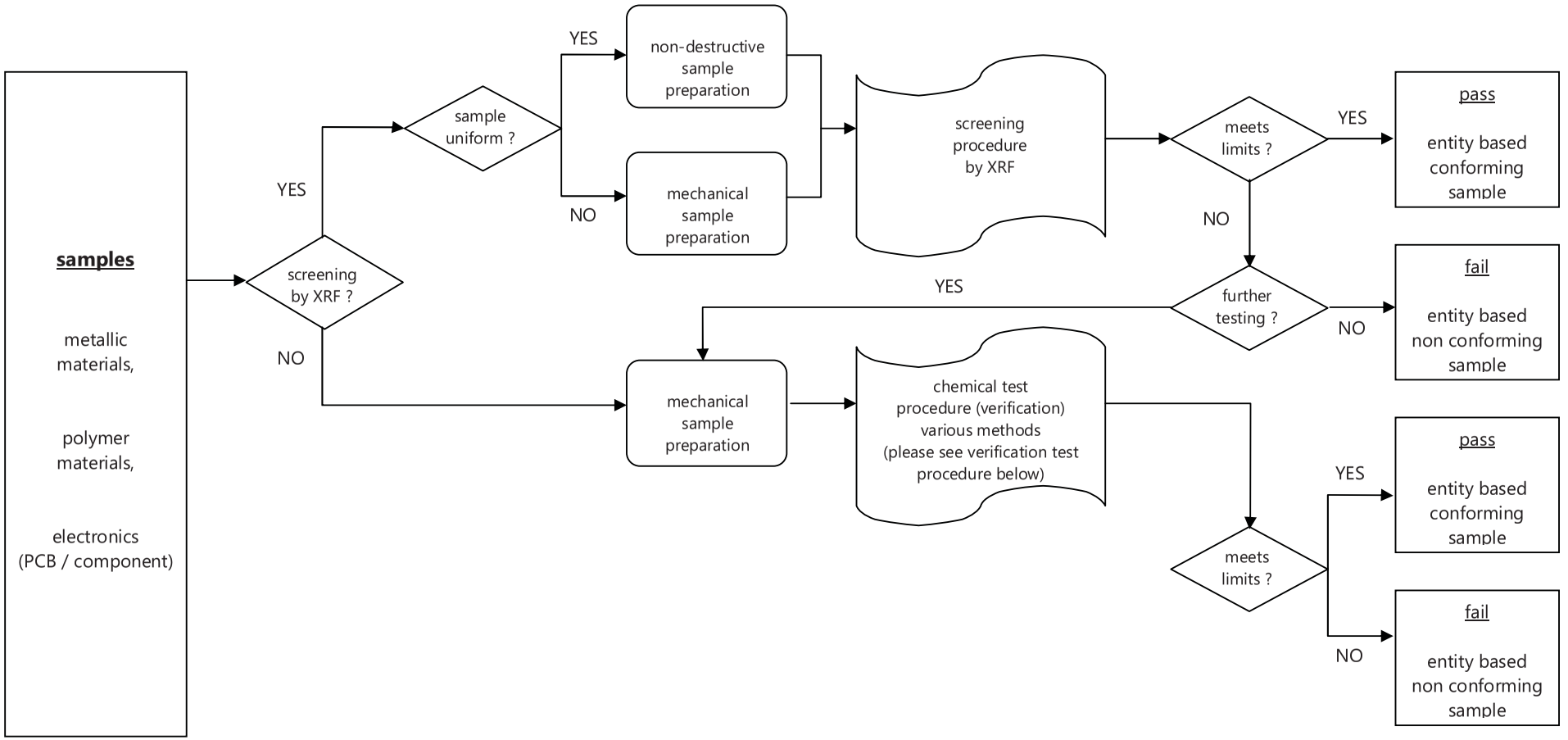
Elements	RoHS-limit value
Lead (Pb)	1000 mg/kg
Mercury (Hg)	1000 mg/kg
Cadmium (Cd)	100 mg/kg
Chromium VI (Cr VI)	1000 mg/kg
Polybrominated Biphenyle (PBBs)	1000 mg/kg
Polybrominated Diphenyl ether (PBDEs)	1000 mg/kg

Intertek Consumer Goods GmbH

Prüfleitung / Lab Manager
□ A. Breunig, □ K. Grönhardt, □ Dr. K. Laue-Schuler, X C. List, □ D. Löw
□ R. Micolay, □ M. Neumeister, □ Dr. R. Rätze, □ K. Scharrer, □ M. Tutsch

- Flow charts see next page(s) -

Test procedure



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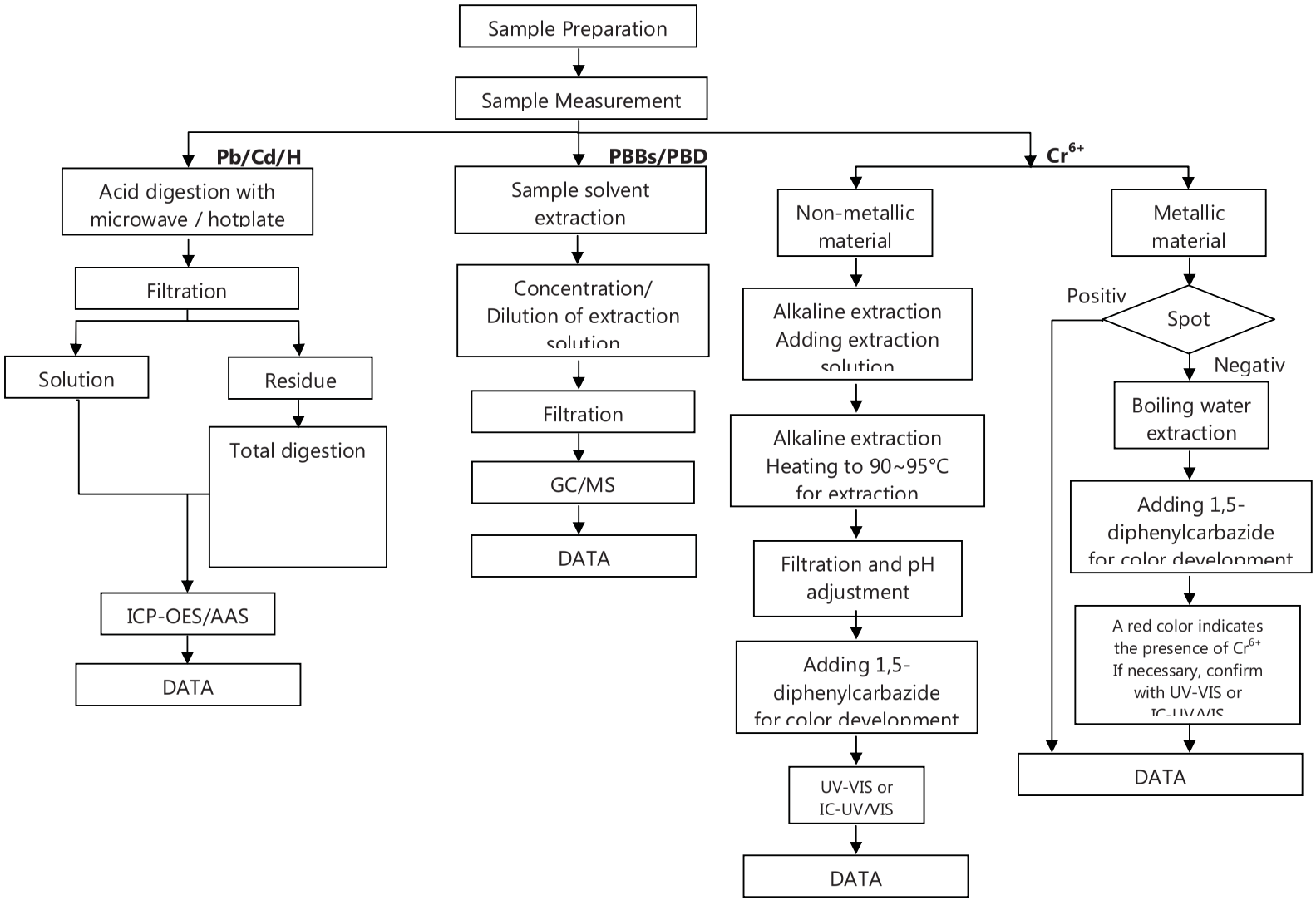
Sitz Fürth
Amtsgericht Fürth, HRB 5756
Ust-IdNr. DE169317871

Geschäftsführer
Kay Grönhardt
Jan-Jörg Müller-Seiler

Verification test procedure



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Sitz Fürth
Amtsgericht Fürth, HRB 5756
Ust-IdNr. DE169317871

Geschäftsführer
Kay Grönhardt
Jan-Jörg Müller-Seiler

Test Report **Number: 140100488SHA-004**

Applicant: Littelfuse Philippines Inc.
LIMA Technology Center, Lipa City,
Malvar, Batangas

Date: Jan. 21, 2014

Sample Description:
One (1) submitted sample said to be:

Item Name	:	Wires with plating
Item No.	:	101--24-.----tin plated, silver plated copper wire - Cu, Ag--%, Sn--%
Country of Origin	:	GERMANY

****

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

****

Conclusion:

Tested sample	Standard	Result
Tested components of submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU)	See Test Conducted

****

To be continued

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

Joy Zhou

Authorized by:
For Intertek testing services Ltd., Shanghai

Jonny Jing
Manager

Intertek Testing Services Ltd., Shanghai 上海天祥质量技术服务有限公司 检测报告专用章

Tests Conducted

(A) Test result of RoHS Directive:

Testing item	Result
	(1)
Cadmium (Cd) content (mg/kg) /plating	ND
Lead (Pb) content (mg/kg) /plating	17
Mercury (Hg) content (mg/kg) /plating	ND
Chromium (VI)(Cr^{6+}) result (by boiling water extraction on metal) (mg/kg with $50cm^2$) /plating	ND

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

Remark： mg/kg with $50cm^2$ = milligram per kilogram with 50 square centimeter

ND = not detected

Tested components:
(1) Silver color metal wire plating
(2) Silver color metal wire substrate

(B) RoHS Requirement:

Restricted substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr^{6+})	0.1% (1000 mg/kg)
Polybrominated biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated diphenyl ethers (PBDEs)	0.1% (1000 mg/kg)

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

****

To be continued

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Tests Conducted

(C) Test method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Lead (Pb) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Mercury (Hg) content	With reference to IEC 62321-4 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Chromium (VI) (Cr^{6+}) content (for metal)	With reference to IEC 62321 Edition 1.0: 2008, by boiling water extraction and determined by UV-VIS Spectrophotometer.	Positive/Negative (Threshold of 0.02mg/kg with $50cm^2$)

Date sample received: Jan. 13, 2014
Testing period: Jan. 13, 2014 To Jan. 16, 2014

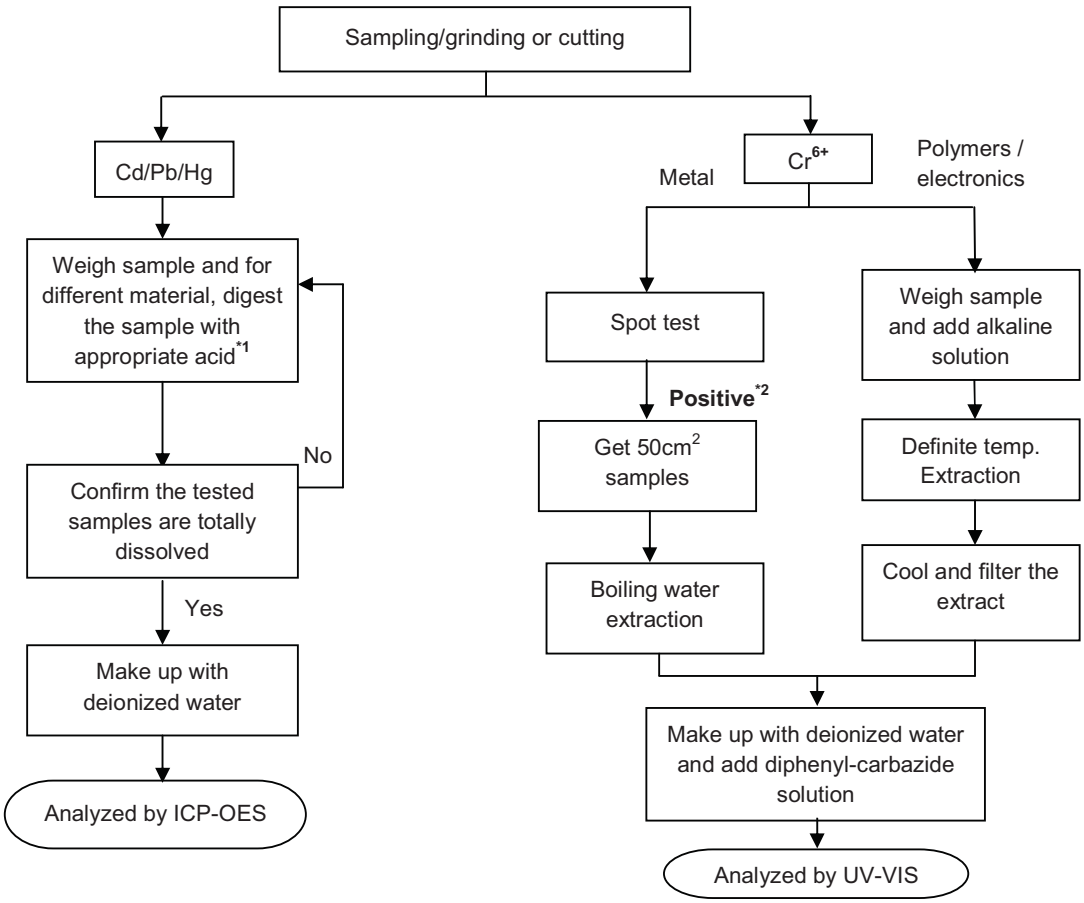
****

To be continued

Tests Conducted

(D) Measurement flowchart：

Test for Cd/Pb/Hg/Cr (VI) contents
Reference standard：IEC 62321 Edition 1.0：2008&2013



Remarks：

*1：list of appropriate acid：

Material	Acid added for digestion
Polymers	HNO_3,HCl,HF,H_2O_2,H_3BO_3
Metals	HNO_3,HCl,HF
Electronics	HNO_3,HCl,H_2O_2,HBF_4

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

****

To be continued

Tests Conducted

****

To be continued

Tests Conducted

****

End of report

Test Report **Number: 140100201SHA-003**

Applicant: LITTELFUSE, INC. Date: Jan. 15, 2014
800 E. NORTHWEST HWY
DES PLAINES, IL 60016
ATTN: J. CABILAN / A. CESISTA JR

Sample Description:
One (1) submitted sample said to be: **White yarn**
Part Description : GLASS YARN
Part Number : 648901

****

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

****

Conclusion:

Tested sample	Standard	Result
Submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU)	Pass

****

To be continued

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

Joy Zhou

Authorized by:
For Intertek testing services Ltd., Shanghai

Jonny Jing
Manager

Intertek Testing Services Ltd., Shanghai 上海天祥质量技术服务有限公司 检测报告专用章

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

Tests Conducted

(I) Test Result Summary：

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

Remarks：ppm = parts per million = mg/kg
ND = not detected

Responsibility of Chemist：John Zeng / Leaf Liu

Date sample received: Jan. 07, 2014
Testing period: Jan. 07, 2014 To Jan. 09, 2014

****

To be continued

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

Tests Conducted

(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^{6+}) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

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

(III) Test Method：

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321-4 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Chromium VI (Cr^{6+}) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

Remark：Reporting limit = Quantitation Limit of Analyze in Sample

****

To be continued

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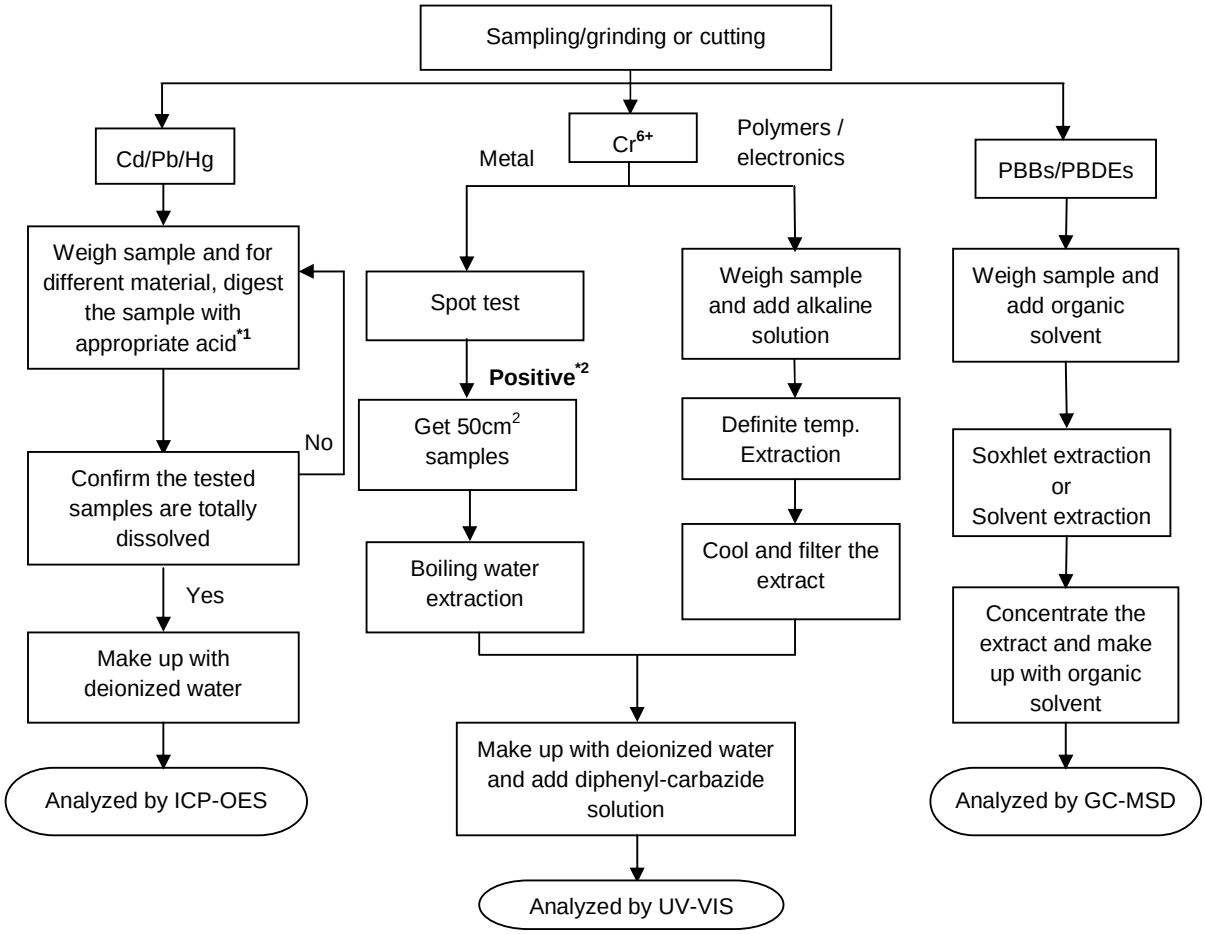
Tests Conducted

(IV) Measurement Flowchart：

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents

Reference Standard: IEC 62321 Edition 1.0：2008 & 2013



Remarks：

*1: List of appropriate acid：

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO_3,HCl,HF,H_2O_2,H_3BO_3
Metals	HNO_3,HCL,HF
Electronics	HNO_3,HCL,H_2O_2,HBF_4

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

****

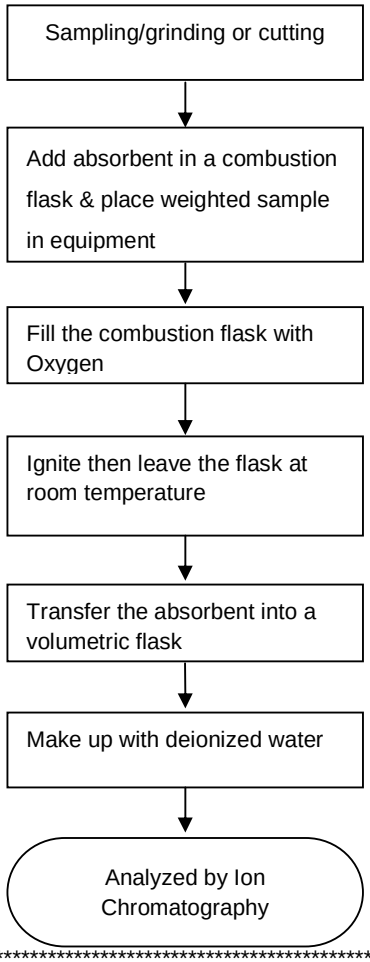
To be continued

Tests Conducted

(V) Measurement flowchart：

Test or Halogen content

Reference standard： EN 14582



****

To be continued

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Tests Conducted

****

End of report

Test Report **Number: 140100201SHA-004**

Applicant: LITTELFUSE, INC.
800 E. NORTHWEST HWY
DES PLAINES, IL 60016
ATTN: J. CABILAN / A. CESISTA JR

Date: Jan. 15, 2014

Sample Description:
One (1) submitted sample said to be: **White yarn**
Part Description : YARN
Part Number : 648115

****

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

****

Conclusion:

Tested sample	Standard	Result
Submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU)	Pass

****

To be continued

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

Joy Zhou

Authorized by:
For Intertek testing services Ltd., Shanghai

Jonny Jing
Manager

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Tests Conducted

(I) Test Result Summary：

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

Date sample received: Jan. 07, 2014
Testing period: Jan. 07, 2014 To Jan. 09, 2014

****

To be continued

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Tests Conducted

(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^{6+}) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

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

(III) Test Method：

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321-4 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Chromium VI (Cr^{6+}) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

Remark：Reporting limit = Quantitation Limit of Analyze in Sample

****

To be continued

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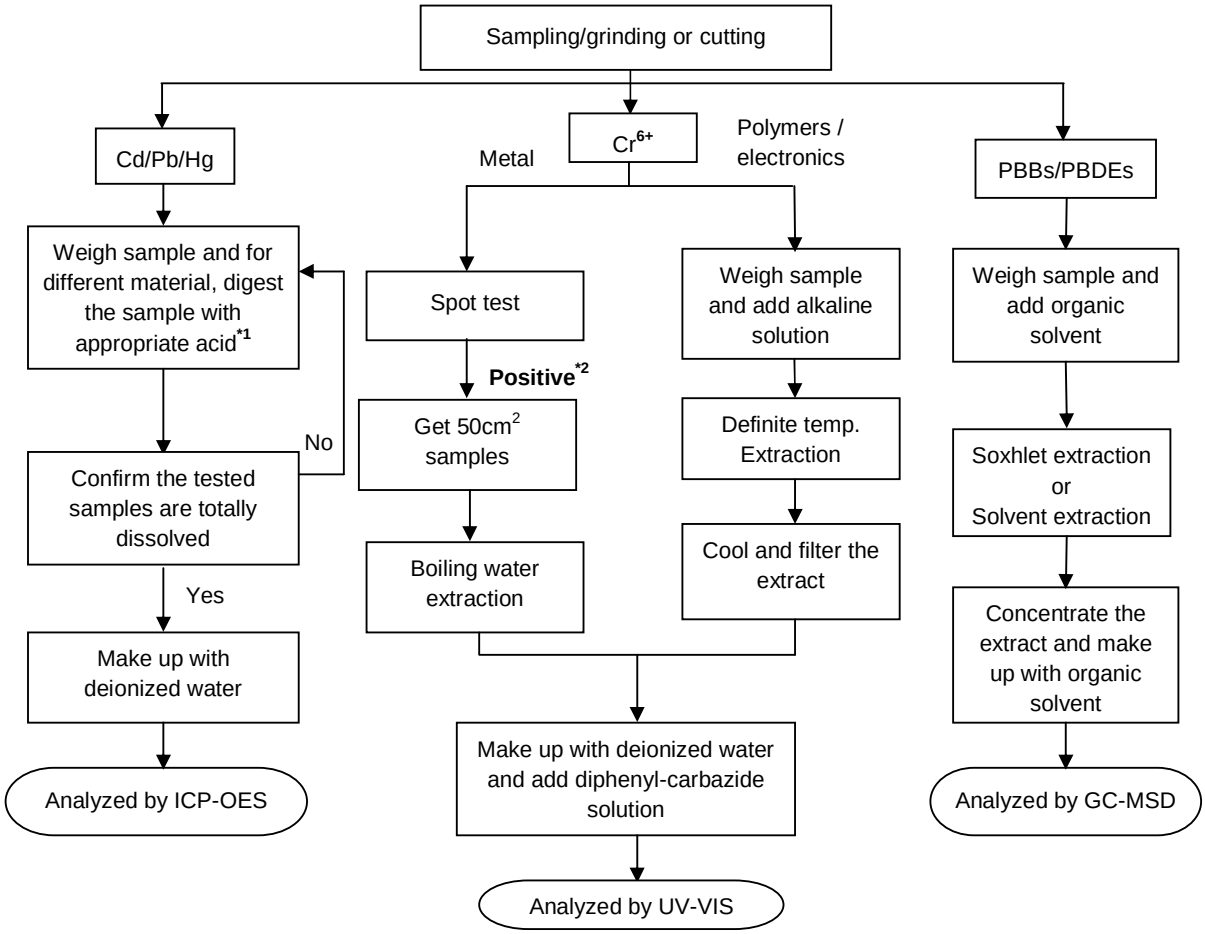
Tests Conducted

(IV) Measurement Flowchart：

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents

Reference Standard: IEC 62321 Edition 1.0：2008 & 2013



Remarks：

*1: List of appropriate acid：

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO_3,HCl,HF,H_2O_2,H_3BO_3
Metals	HNO_3,HCL,HF
Electronics	HNO_3,HCL,H_2O_2,HBF_4

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

****

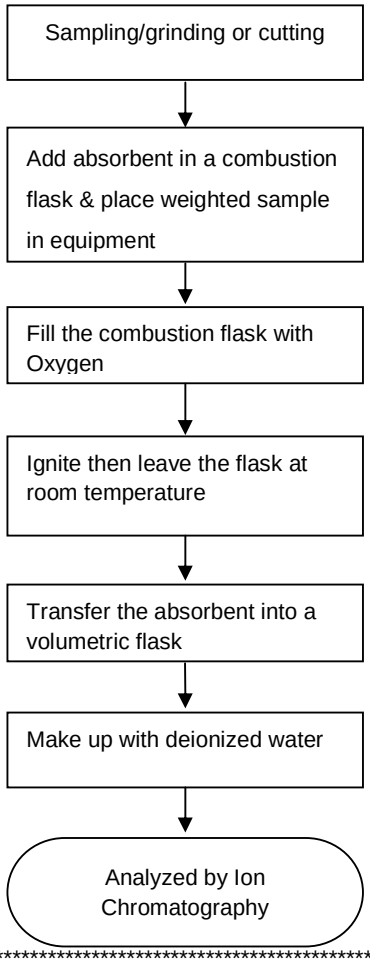
To be continued

Tests Conducted

(V) Measurement flowchart：

Test or Halogen content

Reference standard： EN 14582



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To be continued

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

Tests Conducted

****

End of report

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

Test Report **Number: 140100201SHA-002**

Applicant: LITTELFUSE, INC.
800 E. NORTHWEST HWY
DES PLAINES, IL 60016
ATTN: J. CABILAN / A. CESISTA JR

Date: Jan. 15, 2014

Sample Description:
One (1) submitted sample said to be: **White yarn**
Part Description : GLASS YARN
Part Number : 648150

****

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

****

Conclusion:

Tested sample	Standard	Result
Submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU)	Pass

****

To be continued

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

Joy Zhou

Authorized by:
For Intertek testing services Ltd., Shanghai

Jonny Jing
Manager

Intertek Testing Services Ltd., Shanghai 上海天祥质量技术服务有限公司 检测报告专用章

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Tests Conducted

(I) Test Result Summary：

Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr^{6+}) content	ND
Polybrominated Biphenyls (PBBs**)**	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs**)**	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	1100
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks：ppm = parts per million = mg/kg
ND = not detected

Responsibility of Chemist：John Zeng / Leaf Liu

Date sample received: Jan. 07, 2014
Testing period: Jan. 07, 2014 To Jan. 09, 2014

****

To be continued

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Tests Conducted

(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^{6+}) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

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

(III) Test Method：

Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321-5 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321-4 Edition 1.0: 2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 ppm
Chromium VI (Cr^{6+}) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by Ion Chromatography	50 ppm

Remark：Reporting limit = Quantitation Limit of Analyze in Sample

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To be continued

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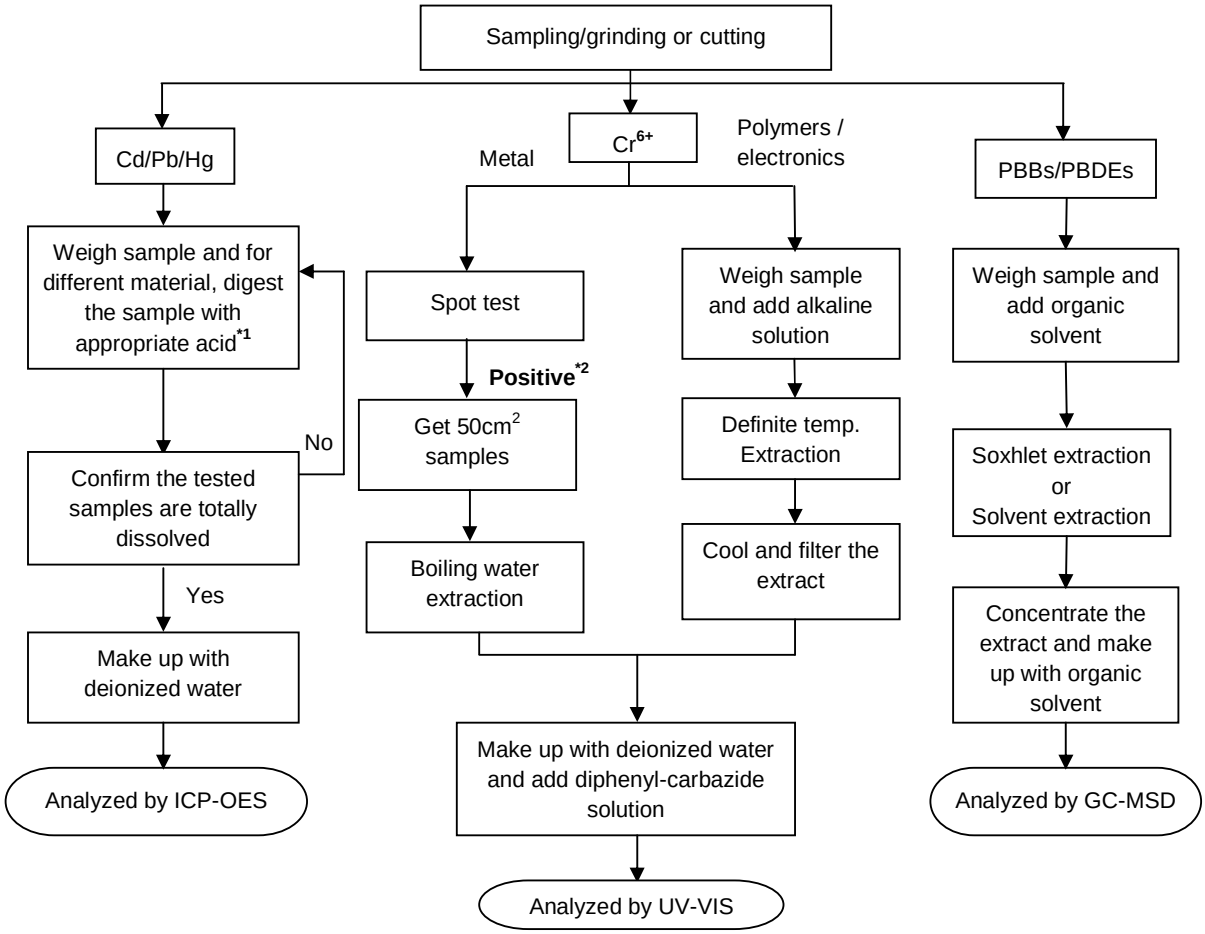
Tests Conducted

(IV) Measurement Flowchart：

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs Contents

Reference Standard: IEC 62321 Edition 1.0：2008 & 2013



Remarks：

*1: List of appropriate acid：

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO_3,HCl,HF,H_2O_2,H_3BO_3
Metals	HNO_3,HCL,HF
Electronics	HNO_3,HCL,H_2O_2,HBF_4

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

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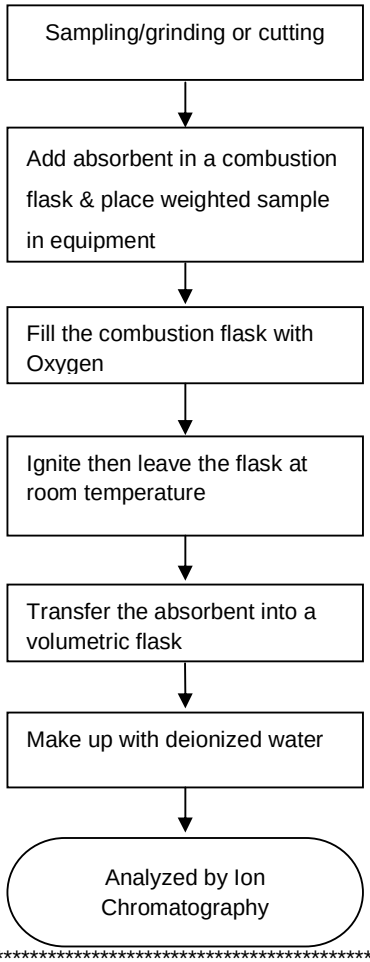
To be continued

Tests Conducted

(V) Measurement flowchart：

Test or Halogen content

Reference standard： EN 14582



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To be continued

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Tests Conducted

****

End of report

Test Report

Number : TWNC00330777
Date : Sep 12, 2013

Applicant: Littelfuse Philippines Inc.
LIMA Technology Center, Lipa City,
Malvar, Batangas

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

Part Description	:	Yarn
Part Number	:	648118_648119_648120(6481xxx_GLZZxxx)
Date Sample Received	:	Sep 06, 2013
Date Test Started	:	Sep 06, 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

Intertek Testing Services Taiwan Ltd.
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Intertek

Test Report

Number: TWNC00330777

Test Conducted

Test Result Summary:

Test Item	Unit	Test Method	Result	RL
			White yarn	
Heavy Metal				
Cadmium (Cd) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Lead (Pb) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Mercury (Hg) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	2
Antimony (Sb) Content	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES.	ND	2
Chromium VI (Cr^{6+}) content	ppm	With reference to IEC 62321: 2008, by alkaline digestion and determined by UV-Vis Spectrophotometer.	ND	1
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ppm	With reference to IEC 62321: 2008, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	ND	5
Dibrominated Biphenyls (DiBB)	ppm		ND	5
Tribrominated Biphenyls (TriBB)	ppm		ND	5
Tetrabrominated Biphenyls (TetraBB)	ppm		ND	5
Pentabrominated Biphenyls (PentaBB)	ppm		ND	5
Hexabrominated Biphenyls (HexaBB)	ppm		ND	5
Heptabrominated Biphenyls (HeptaBB)	ppm		ND	5
Octabrominated Biphenyls (OctaBB)	ppm		ND	5
Nonabrominated Biphenyls (NonaBB)	ppm		ND	5
Decabrominated Biphenyl (DecaBB)	ppm		ND	5

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Intertek

Test Report

Number: TWNC00330777

Test Conducted

Test Item	Unit	Test Method	Result	RL
			White yarn	
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ppm	With reference to IEC 62321: 2008, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	ND	5
Dibrominated Diphenyl Ethers (DiBDE)	ppm		ND	5
Tribrominated Diphenyl Ethers (TriBDE)	ppm		ND	5
Tetrabrominated Diphenyl Ethers (TetraBDE)	ppm		ND	5
Pentabrominated Diphenyl Ethers (PentaBDE)	ppm		ND	5
Hexabrominated Diphenyl Ethers (HexaBDE)	ppm		ND	5
Heptabrominated Diphenyl Ethers (HeptaBDE)	ppm		ND	5
Octabrominated Diphenyl Ethers (OctaBDE)	ppm		ND	5
Nonabrominated Diphenyl Ethers (NonaBDE)	ppm		ND	5
Decabrominated Diphenyl Ether (DecaBDE)	ppm		ND	5
Halogen Content				
Fluorine (F)	ppm	With reference to EN 14582:2007 by combustion bomb with oxygen and determined by Ion Chromatography.	ND	50
Chlorine (Cl)	ppm		ND	50
Bromine (Br)	ppm		ND	50
Iodine (I)	ppm		ND	50
Phthalates				
Di(2-ethylhexyl) Phthalate (DEHP)	ppm	With reference to EN 14372: 2004, by solvent extraction and determined by GC-MS.	ND	10
Dibutyl Phthalate (DBP)	ppm		ND	10
Benzyl Butyl Phthalate (BBP)	ppm		ND	10
Diisobutyl phthalate (DIBP)	ppm		ND	10
Others				
Hexabromocyclododecane (HBCDD)	ppm	With reference to USEPA 3540C, by solvent extraction and determined by GC-MS.	ND	10

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Intertek

Test Report

Number: TWNC00330777

Test Conducted

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

Responsibility of Chemist: Kevin Liu/ Irene Chiou/ Vico Lin

Date Sample Received : Sep 06, 2013
Test Period : Sep 06, 2013 to Sep 10, 2013

RoHS Limit

Restricted Substances	Limits
Cadmium (Cd) content	0.01% (100ppm)
Lead (Pb) content	0.1% (1000ppm)
Mercury (Hg) content	0.1% (1000ppm)
Chromium VI (Cr^{6+}) content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

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

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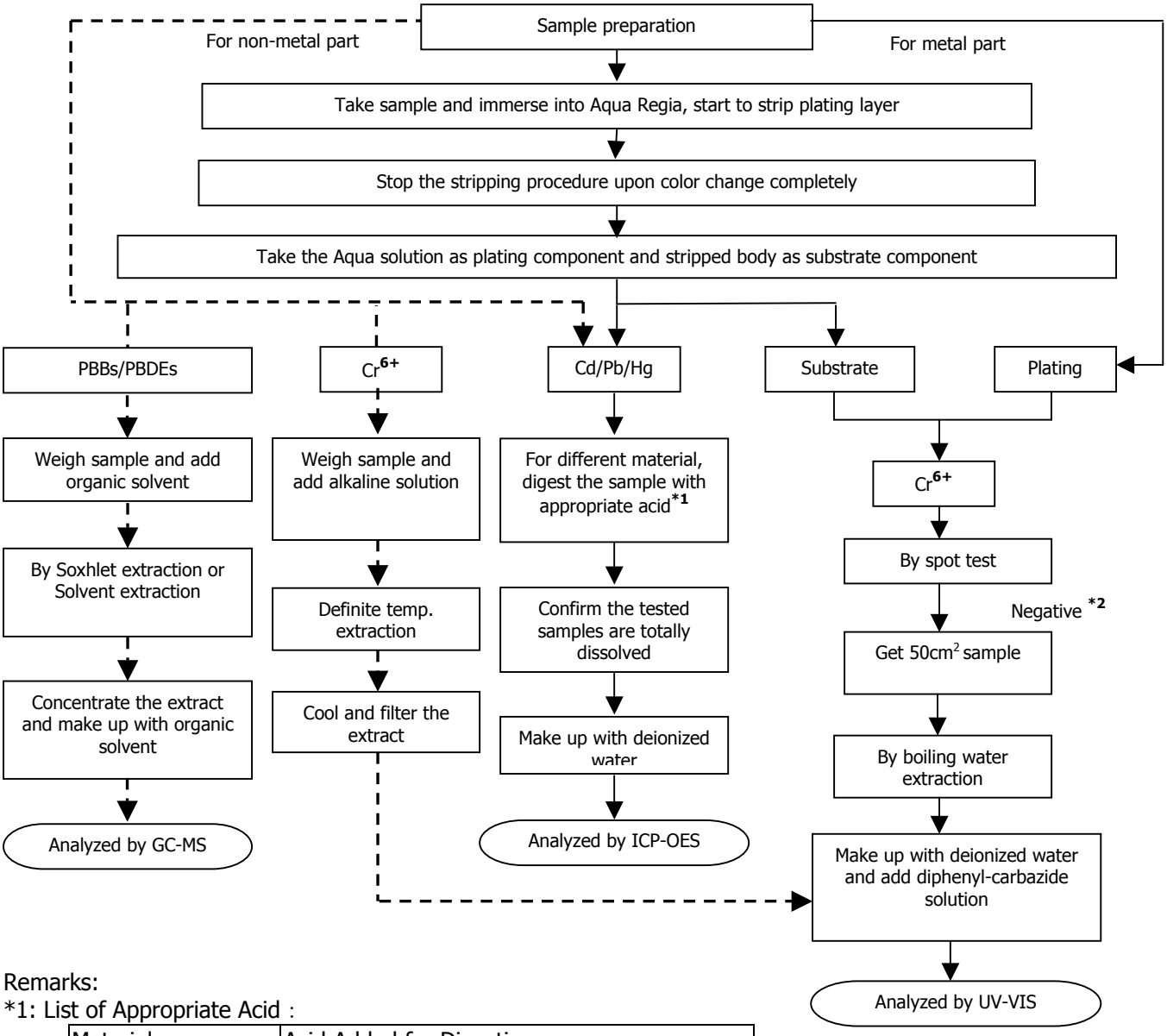
Test Report

Number: TWNC00330777

Test Conducted
Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents
Reference Method: IEC 62321 edition 1.0:2008



Remarks:
*1: List of Appropriate Acid :

Material	Acid Added for Digestion
Polymers	HNO_3,HCl,HF,H_2O_2,H_3BO_3
Metals	HNO_3,HCl,HF
Electronics	HNO_3,HCl,H_2O_2,HBF_4

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

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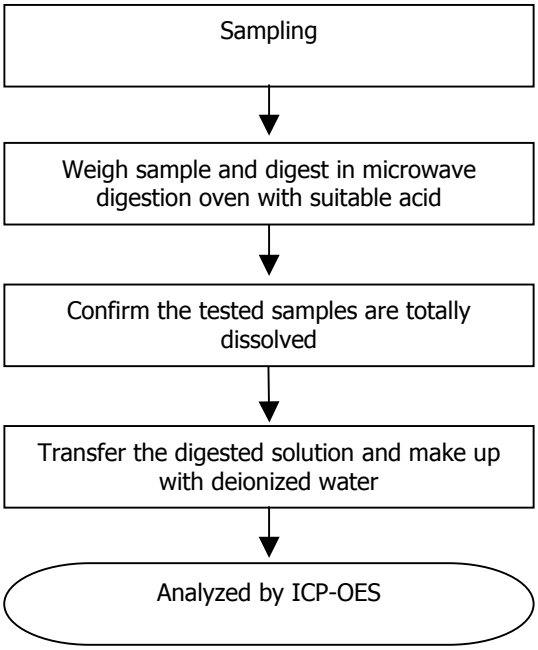
Test Report

Number: TWNC00330777

Test Conducted

Measurement Flowchart:

Test for Heavy Metal (Sb) Contents
Reference Method：USEPA 3052



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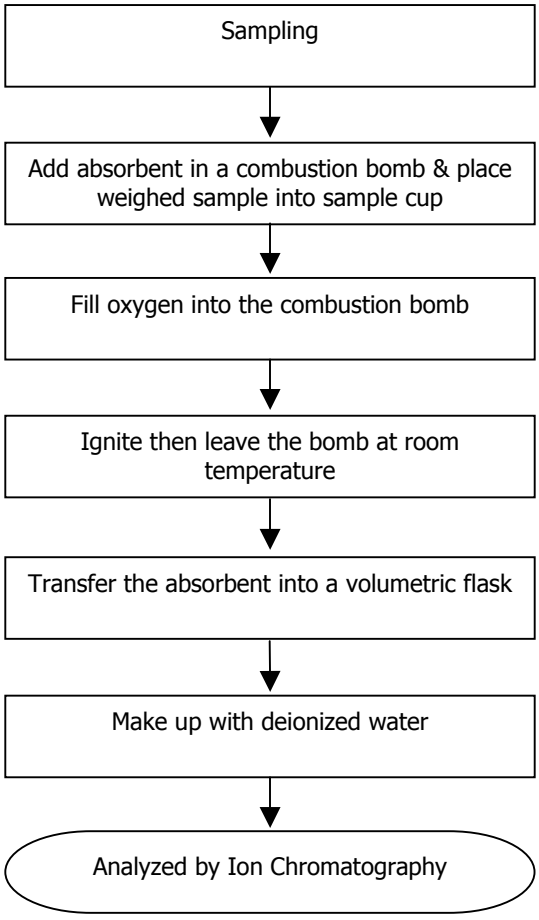
Test Report

Number: TWNC00330777

Test Conducted

Measurement Flowchart:

Test for Halogen Contents
Reference Method：EN 14582



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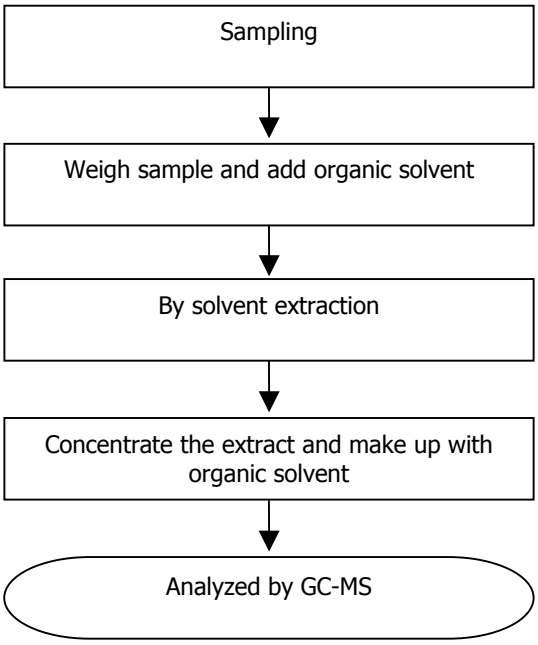
Test Report

Number: TWNC00330777

Test Conducted

Measurement Flowchart:

Test for Phthalates Contents
Reference Method: EN 14372: 2004



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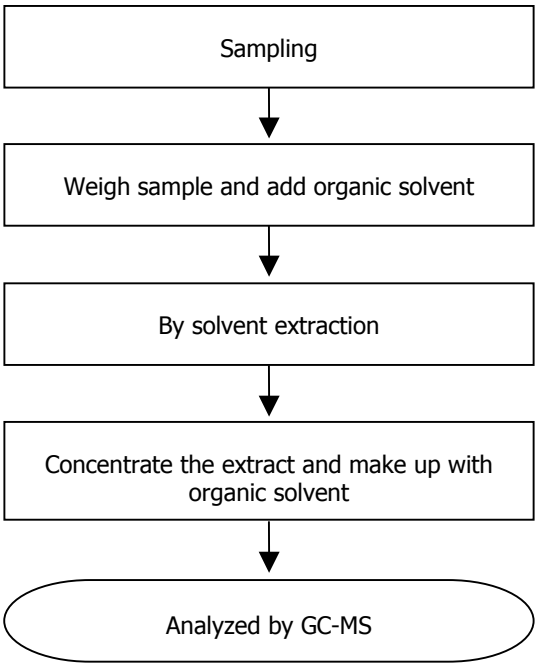
Test Report

Number: TWNC00330777

Test Conducted
Measurement Flowchart:

Test for Hexabromocyclododecane (HBCDD) Content
Reference Method：USEPA 3540C



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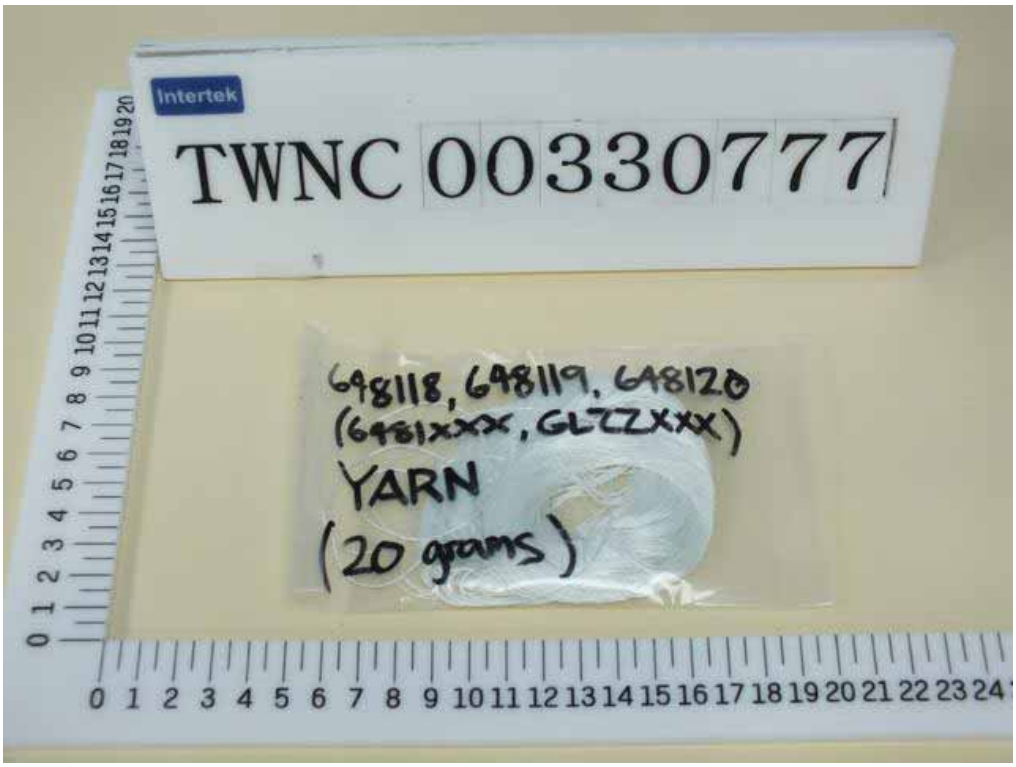

End of Report

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Intertek

Number: TWNC00330777

TERMS AND CONDITIONS OF BUSINESS

1. Intertek Testing Services Taiwan Ltd. (hereinafter "the Company") agrees to provide its services in accordance with and subject to the terms and conditions herein contained (hereinafter "the Conditions"). The Conditions may only be modified by a variation expressed in writing and signed on behalf of the Company by a director and no other action on the part of the Company or its employees or agents shall be construed as an acceptance of any other terms and conditions.
2. The Company acts for the person or body from whom the request to provide its services has originated (hereinafter "the Principal"). No other party is entitled to give instructions to the Company unless agreed by the Company.
3. All rights (including but not limited to copyright) in any test reports, surveys, certificates of inspection or other material produced by the Company in the course of providing its services shall remain vested in the Company. The Principal shall not reproduce or make copies, publish or disclose the contents of any such material or extracts thereof to any third party without the Company's prior written consent, which may be refused at its discretion. The Principal further undertakes that its servants and agents shall keep confidential and shall not publish or otherwise use any information that may be acquired relating to the Company's activities.
4. 4.1 The Company undertakes to exercise due care and skill in the performance of its services and accepts responsibility only where such skill and care is not exercised.
   4.2 The liability of the Company in respect of any claims for loss, damage or expense of whatsoever nature and howsoever arising in respect of any breach of contract and/or any failure to exercise due skill and care by the Company shall in no circumstances exceed a total aggregate sum equal to ten (10) times the amount of the fee or commission payable in respect of the specific service required under the particular contract with the Company which gives rise to such claims provided however that the Company shall have no liability in respect of any claims for indirect or consequential loss including loss of profit and/or loss of future business and/or loss of production and/or cancellation of contracts entered into by the Principal.
   4.3 The Company shall not in any event be liable for any loss or damage caused by delay in performance or non-performance of any of its services where the same is occasioned by any cause whatsoever that is beyond the Company's control including but not limited to war, civil disturbance, requisitioning, governmental or parliamentary restriction, prohibitions or enactment of any kind, import or export regulations, strike or trade dispute (whether involving its own employees or those of any other person), difficulties in obtaining workmen or materials, breakdown of machinery, fire or accident. Should any such event occur the Company may cancel or suspend any contract for the provision of services without incurring any liability whatsoever.
   4.4 The Company will not be liable to the Principal for any loss or damage whatsoever sustained by the Principal as a result of any failure by the Company to comply with any time estimate given by the Company relating to the provision of its services. [See clause 9.1] [See clause 9.2]
   4.5 The Principal acknowledges that samples may be damaged or destroyed in the course of testing carried out by the Company or any of the Company's agent or subcontractor as part of the necessary testing process and the Company shall not in any event be liable for any loss or damage arising from the damage or destruction of the samples subject to testing.
   4.6 In the event that the Principal requests for the return of the samples, the Company shall not be responsible for any re-packaging of the samples prior to such return and the Company shall in no circumstances be liable for any loss or damage caused to any of the samples during or as a result of their shipment to the Principal for the purpose of this Clause 4.6.
5. 5.1 Subject to the Principal's instructions as accepted by the Company, the test reports, surveys, certificates of inspection or other material produced by the Company shall contain statements of opinion made with due care within the limitation of the instructions received by the Company. The Company is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received.
   5.2 For pre-shipment inspection or survey of goods, the Company's inspector shall perform the inspection or survey when goods are 100% completed, packed and marked (unless otherwise agreed between the Company and the Principal). Goods for inspection or survey shall be unpacked in the presence of the Company's inspector and inspection or survey shall, subject to Condition 5.3, take place at the place specified by the Principal.
   5.3 If the Company's inspector finds that the location is not suitable for carrying out a proper inspection or survey of goods or where necessary equipment for inspection or survey is not available the inspector may, if practical in the circumstances, draw samples of goods from the location and carry out the inspection or survey at the premises of the Company. The Principal shall be responsible for all costs and expenses incurred in relation thereto.
   5.4 Reports, surveys or certificates issued following testing or analysis of samples contain the Company's specific opinion on those samples only but do not express any opinion upon the bulk from which the samples were drawn. If an opinion on the bulk is requested special arrangements in writing must be made in advance with the Company for the inspection and sampling of the bulk. In no circumstances shall the Company's responsibility extend beyond inspection, testing and reporting upon the samples actually drawn from the bulk and inspected, tested and surveyed by the Company and any inference to be drawn from the results of such inspection or survey or testing shall be entirely in the discretion and at the sole and exclusive responsibility of the Principal.
6. The Company shall be entitled at its discretion to delegate the performance of the whole or any part of the services contracted for with the Principal to any agent or subcontractor.
7. Every officer, employee, agent or subcontractor of the Company shall have the benefit of the limitations of liability and the indemnities contained in the General Conditions. So far as relates to such limitations and indemnities, any contract entered into by the Company is entered into not only on its own behalf but also as agent and trustee for every such person as aforesaid.
8. If the requirements of the Principal necessitate the analysis of samples by the Principal or by any third party the Company will pass on the results of the analysis but without responsibility for its accuracy. Where the Company is only able to witness an analysis by the Principal or by any third party the Company will provide confirmation, if such be the case, that a correct sample has been analysed but will not otherwise be responsible for the accuracy of such analysis.
9. The Principal will:
   9.1 ensure that instructions to the Company are given in due time and are accompanied by sufficient information to enable the required services to be performed effectively;
   9.2 accept that documents reflecting arrangements or agreements made between the Principal and any third party, or third party documents such as copies of contracts of sale, letters of credit, bills of lading, etc. are -if received by the Company considered to be for information only, without extending or restricting the services to be provided or obligations accepted by the Company.
   9.3 procure all necessary access for the Company's representatives to enable the required services to be performed effectively.
   9.4 supply, if required, any special equipment and personnel necessary for the performance of the required services.
   9.5 ensure that all necessary measures are taken for safety and security of working conditions, sites and installations during the performance of the required services;

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

9.6 take all necessary steps to eliminate or remedy any obstruction to or interruptions in the performance of the required services and repack all inspected goods immediately after any inspection or survey of them;

9.7 inform the Company in advance of any known hazards or dangers, actual or potential, associated with any request for the provision of services by the Company including but not limited to the presence or risk of radiation, toxic or noxious or explosive elements or materials, environmental pollution or poisons;

10. The Principal shall guarantee, hold harmless and indemnify the Company and its officers, employees, agents or subcontractors against :

10.1 all claims made by any third party for any loss, damage or expense of whatsoever nature and howsoever arising relating to the performance, purported performance or non-performance of any of services to the extent that the aggregate of any such claims relating to any one service exceeds the limit mentioned in Condition 4.2.

10.2 any loss or damage suffered by the Company as a result of the provision of services by the Company to the Principal otherwise than resulting from the Company's own error, negligence or wilful default.

11. 11.1 The Principal will punctually pay the Company immediately upon presentation of the relevant invoice or within such other period as may have been agreed in writing by the Company all charges rendered by the Company failing which interest will become due at the rate of 1.5 per cent per month from the date of invoice until payment. The Principal further agrees and undertakes to reimburse the Company all disbursements reasonably incurred in connection with the provision of its services.

11.2 The Principal shall not be entitled to retain or defer payment of any sums due to the Company on account of any dispute, cross claim or set off which it may allege against the Company.

11.3 In the event of any suspension of payment arrangement with creditors, bankruptcy, insolvency, receivership or cessation of business or failure of the Principal to pay part or all of any sums owing to the Company, the Company shall be entitled to suspend all further performance of its services and withhold the issue of any test report, survey, certificate of inspection or other material requested forthwith and without liability until payment of all sums owing to the Company together with interest thereon is made

12. Without prejudice to any rights the Company may have at law or under the Conditions, the Company has the following rights in the event of non-payment of sums owing to the Company as set out below:

12.1 The Company has a general and particular lien over all samples delivered to be tested for all claims and sums owing by the Principal to the Company under any contract whatsoever and in any other way whatsoever.

12.2 During the currency of any such lien the Company is entitled to be paid reasonable storage charges for samples retained in the Company's custody.

12.3 Without prejudice to the Company's lien and other rights under Conditions 12.1 to 12.2 above, if test, inspection or survey of the goods takes place on the premises of the Company, the Company may give notice to the Principal that the goods (or any part thereof) are ready for collection and the Principal shall collect the same within three (3) calendar days (Saturdays, Sundays and Public Holidays excepted). Upon the expiry of this period, if the goods are not collected by the Principal, at the sole discretion of the Company the goods may be deemed abandoned and/or destroyed.

12.4 Without prejudice to Conditions 12.3 above, the Company shall have the discretion to store the goods (or any of them) at their own premises or elsewhere at the Principal's expense if the Principal has deposited the goods at the Company's premises for the performance of these services and has subsequently failed to collect the said goods.

12.5 The expenses by way of disbursements that the Company may reclaim from the Principal include all reasonable costs incurred by the Company (whether by way of storage, insurance or otherwise) in respect of the goods and it is expressly declared that it shall be reasonable but not mandatory for the Company to effect comprehensive insurance in respect of the goods.

12.6 Without prejudice to the Company's lien and other rights under Conditions 12.1 to 12.5 above, the risk and property in the goods shall remain at all times in the Principal.

13. In the event of the Company being prevented by reason of any cause whatsoever outside the Company's control from performing or completing any service for which an order has been given or an agreement made, the Principal will pay to the Company:

13.1 the amount of all abortive expenditure actually made or incurred; and

13.2 a proportion of the agreed fee or commission equal to the proportion (if any) of the service actually carried out;

and the Company shall be relieved of all responsibility whatsoever for the partial or total non-performance of the required service.

14. The Company shall be discharged from all liability to the Principal for all claims for loss, damage or expense unless suit is brought within twelve (12) months after the date of the performance by the Company of the service which gives rise to the claim or in the event of any alleged non-performance within twelve (12) months of the date when such service should have been completed.

15. In the event that any unforeseen additional time or costs are incurred in the course of carrying out any of its services the Company shall be entitled to render additional charges as shall reasonably reflect such additional time and costs incurred.

16. All contracts for provision of services by the Company and the Conditions shall be construed in accordance with and governed by the laws of the ROC and for the purpose of any arbitral or litigation proceedings such contracts shall be deemed to have been made and performed in Taiwan. If any provision contained in the Conditions is and/or becomes invalid, illegal or unenforceable in any respect under the laws of the ROC, the validity, legality and enforceability of the remaining provisions hereof shall not in any way be affected or impaired thereby.

17. Any dispute or claim arising out of or relating to the provision of, or any agreement to provide, services by the Company shall be referred to and determined by arbitration subject to the Company's sole and overriding discretion to commence litigation proceedings in the courts of Taiwan or the courts of any other country as the Company may choose. The parties may agree to the appointment of an arbitrator failing which either party may, after having made a written request to concur in the appointment of an arbitrator, request the ROC Arbitration Association to appoint an arbitrator. The place of arbitration shall be in Taiwan. There shall only be one arbitrator.

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LITTELFUSE PHILIPPINES INC.
LIMA TECHNOLOGY CENTER, LIPA CITY,
MALVAR, BATANGAS

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

SGS Job No. :	SP13-026309 - SH
Model No. :	YTW108（692535-001、692535-003、693535-004）
Composition :	Sn3.0CuRE
Date of Sample Received :	03 Sep 2013
Testing Period :	03 Sep 2013 - 06 Sep 2013
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

JJ Fan
Approved Signatory

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HL: (86-21) 61402594 HL: (86-21)54500353 e sgs.china@sgs.com

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA13-175188.038	Silvery metal wire

Remarks :

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

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

Test Item(s)	Limit	Unit	MDL	*038*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	129
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

Test Item(s)	Limit	Unit	MDL	*038*
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

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

(2) ◇Spot-test:

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

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

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

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

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

Halogen

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

Test Item(s)	Unit	MDL	*038*
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	392
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

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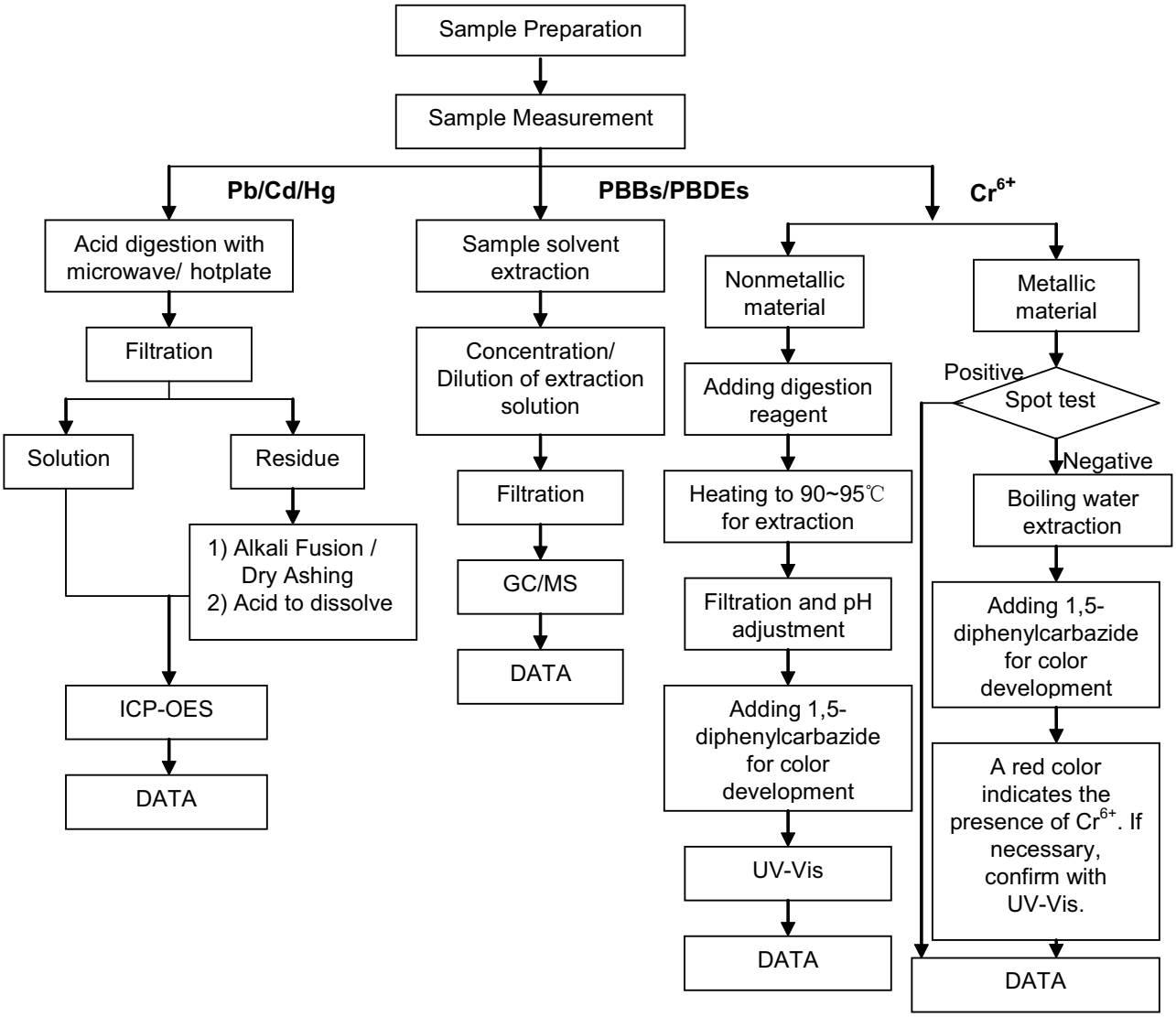
ATTACHMENTS

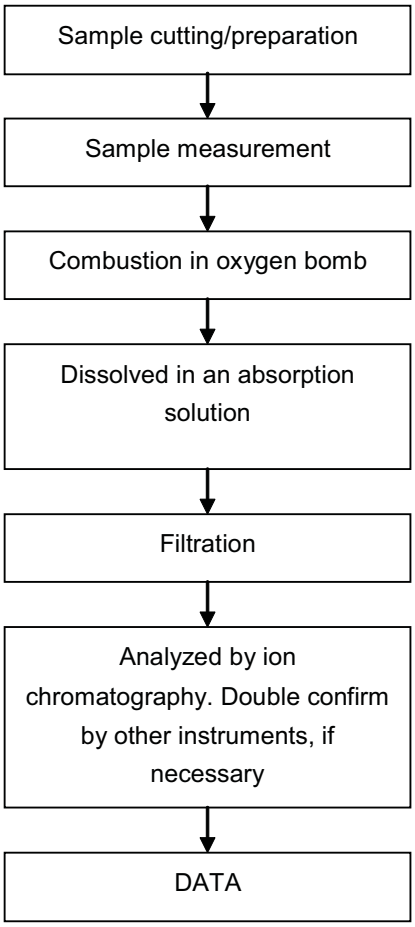
RoHS Testing Flow Chart

1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



Halogen Testing (oxygen bomb) Flow Chart

1) Name of the person who made testing: Sisily Yin
2) Name of the person in charge of testing: Linda Li



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Sample photo:

SHA13-175188.038

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

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

LITTELFUSE PHILIPPINES INC.
LIMA TECHNOLOGY CENTER, LIPA CITY,
MALVAR, BATANGAS

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

SGS Job No. :	SP13-026309 - SH
Model No. :	YTW102（692539-002）
Composition :	Sn2.0CuRE
Date of Sample Received :	03 Sep 2013
Testing Period :	03 Sep 2013 - 06 Sep 2013
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

JJ Fan
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	SHA13-175188.040	Silvery metal wire

Remarks :

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

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

Test Item(s)	Limit	Unit	MDL	*040*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	140
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	◇	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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Test Item(s)	Limit	Unit	MDL	*040*
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

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

(2) ◇Spot-test:

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

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

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

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

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

Halogen

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

Test Item(s)	Unit	MDL	*040*
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	354
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

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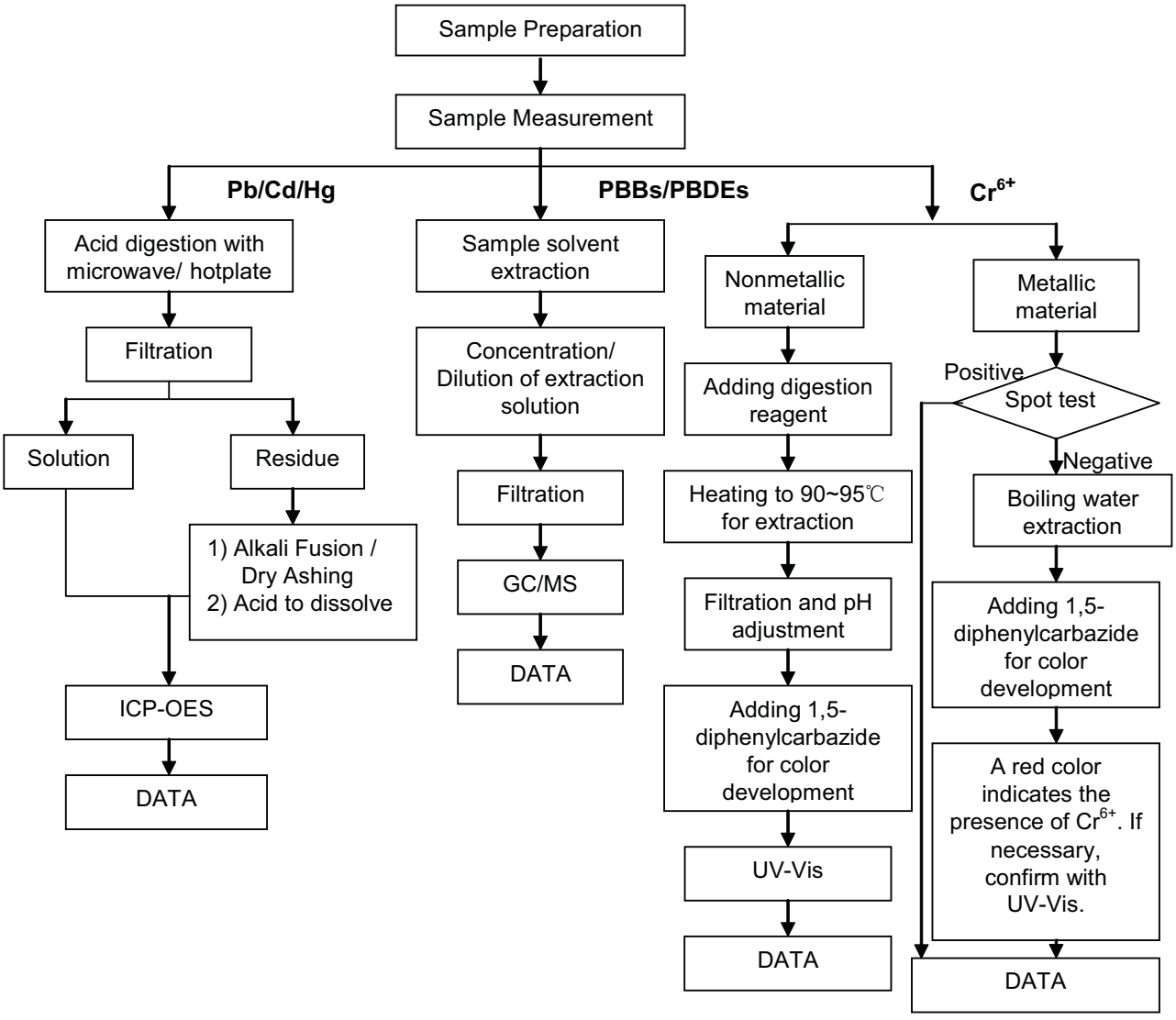
ATTACHMENTS

RoHS Testing Flow Chart

1) Name of the person who made testing: Jan Shi/Star Wang/Shara Wang/Gary Xu
2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Jessy Huang
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded)



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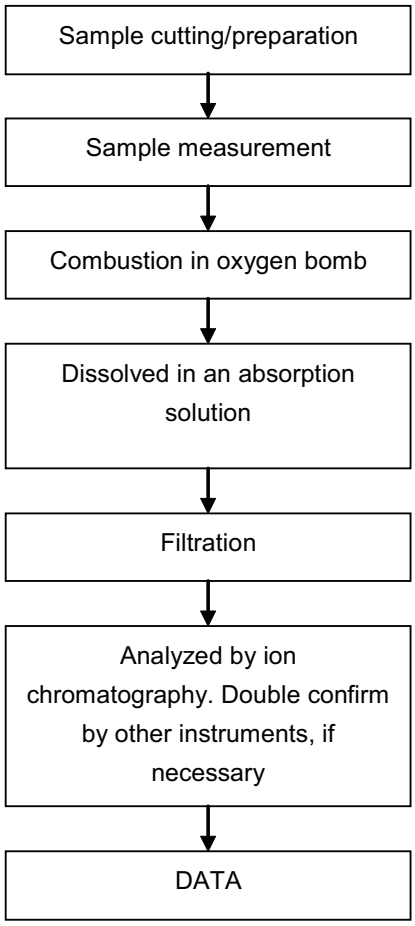
Halogen Testing (oxygen bomb) Flow Chart

1) Name of the person who made testing: Sisily Yin
2) Name of the person in charge of testing: Linda Li



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Sample photo:

SHA13-175188.040

SGS authenticate the photo on original report only

*** End of Report ***

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TEST REPORT

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: Oct. 10, 2013

Testing period: From Oct. 10, 2013 to Oct. 12, 2013

Testing Requested

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

Testing method:

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

Note:

-* 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 Directive 2011/65/EU (RoHS).

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

Signed for and on behalf of

Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

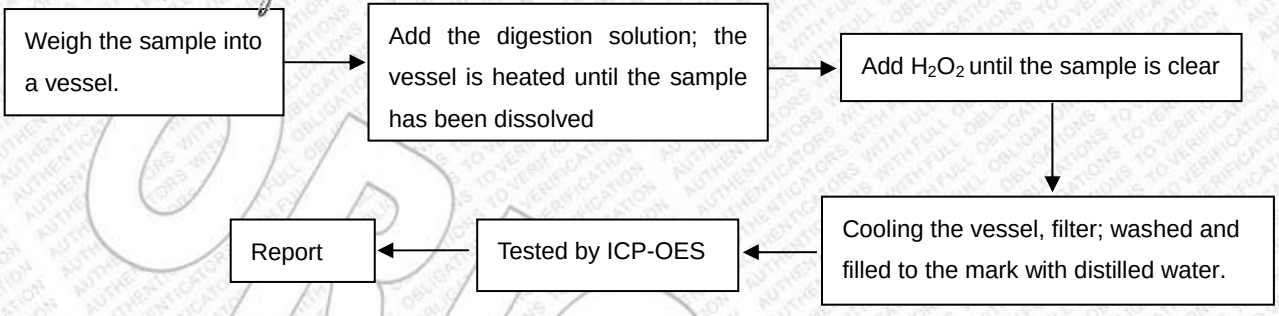
Project Leader: Maggie	Reviewed by: Weikin	Approved by: Mickey
Li Tingting, Maggie	Wang Wexin, Weikin	Yuan Qi, Mickey
Chemical Test Director	Technical Director	Lab Manager

TEST REPORT

Test Flow:

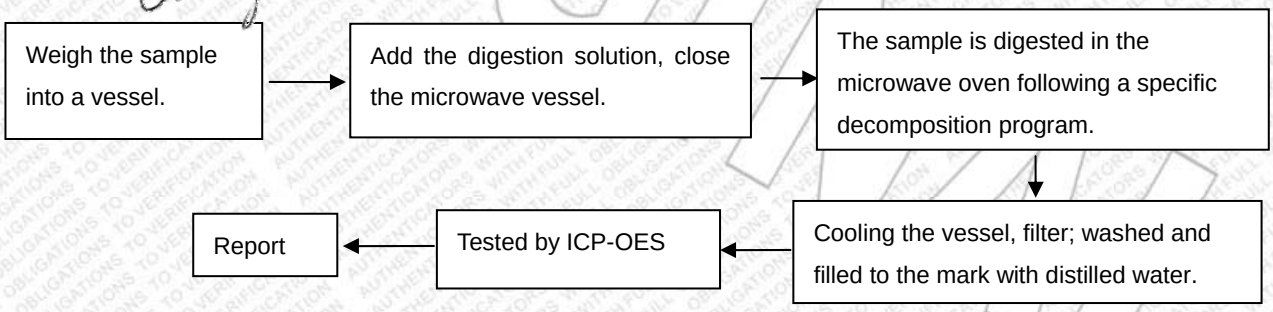
1. To Determine Lead, Cadmium Content: (Metal parent metal)

Tested by: Condy



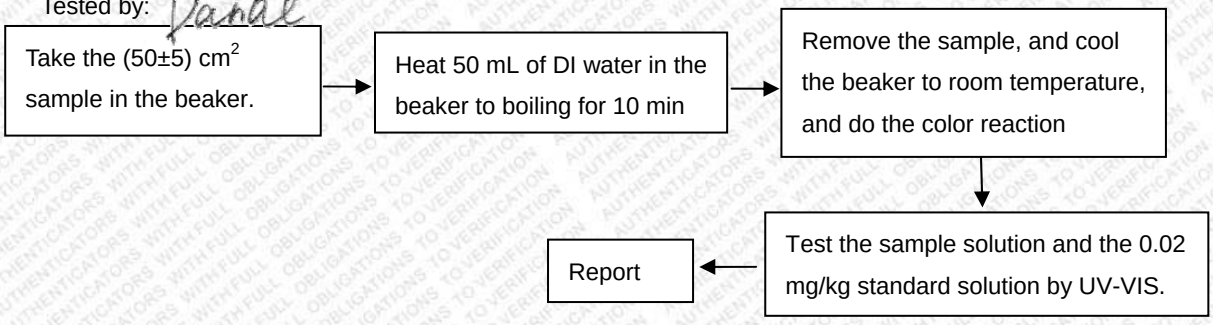
2. To Determine Mercury Content: (Metal parent metal)

Tested by: Condy



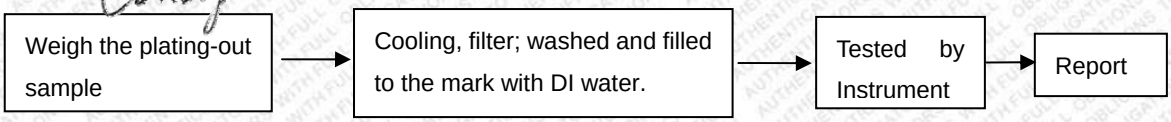
3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal parent metal)

Tested by: Danal



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

Tested by: Condy

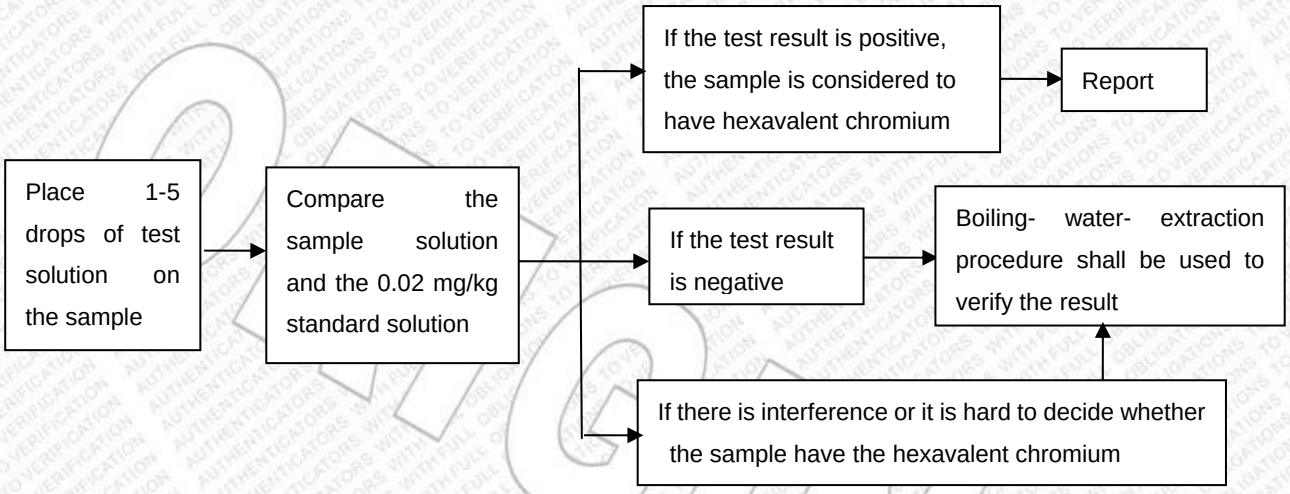


TEST REPORT

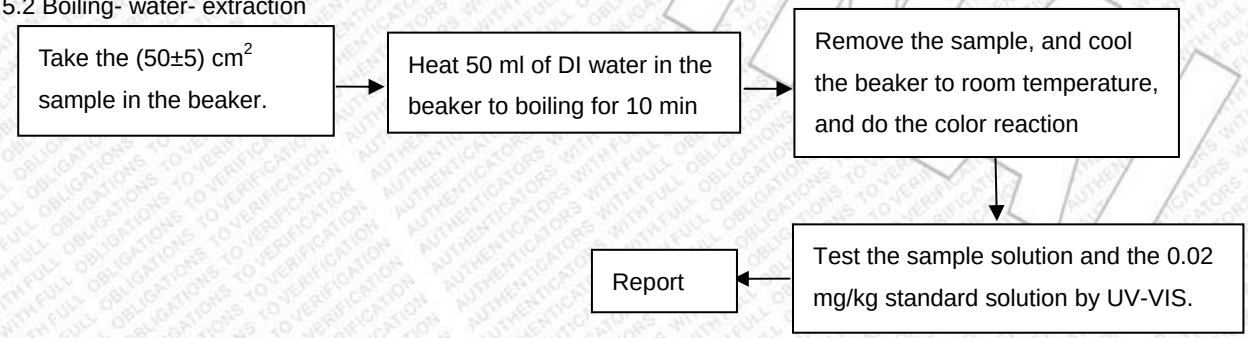
5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating)

Tested by: Danae

5.1 Spot-test



5.2 Boiling- water- extraction



Test Results:

Item	Unit	RoHS Limit	Results	
			substrate	Plating**
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

Note:

-N.D.=not detected(<MQL)

-MQL=Method Quantitation Limit

-Negative=Absence of Cr (Ⅵ) coating;

Positive=Presence of Cr (Ⅵ) coating;

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

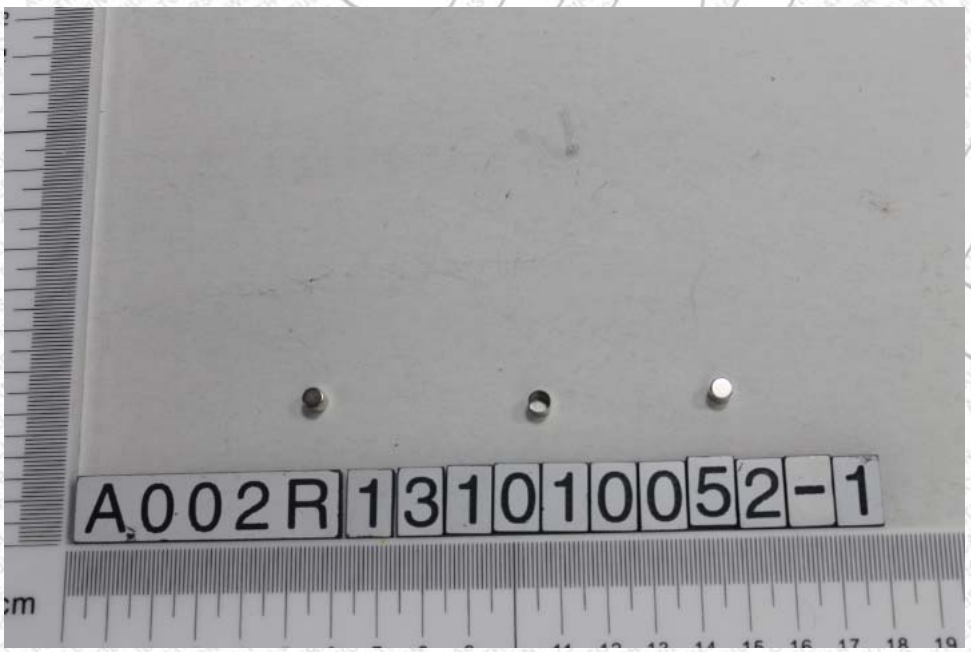
（The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.）

-**Testing part-- Plating

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

LITTELFUSE PHILIPPINES INC.
LIMA TECHNOLOGY CENTER, LIPA CITY,
MALVAR, BATANGAS

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

SGS Job No. :	XM14644726EC - XM
Date of Sample Received :	18 Jun 2013
Testing Period :	18 Jun 2013 - 24 Jun 2013
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

Almay Gao
Approved Signatory

Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN13-091503.002	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

Test Item(s)	Limit	Unit	MDL	*002*
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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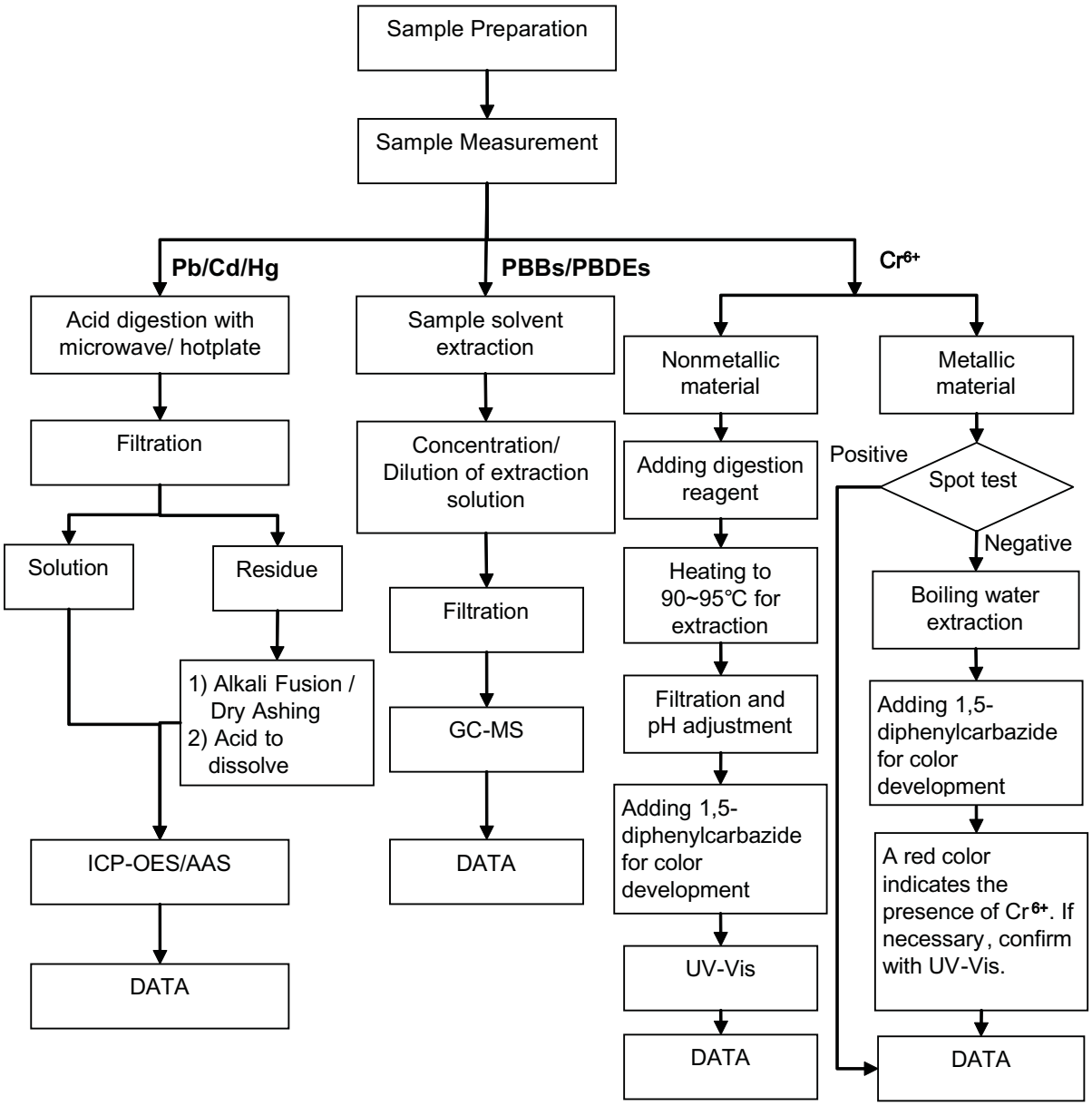
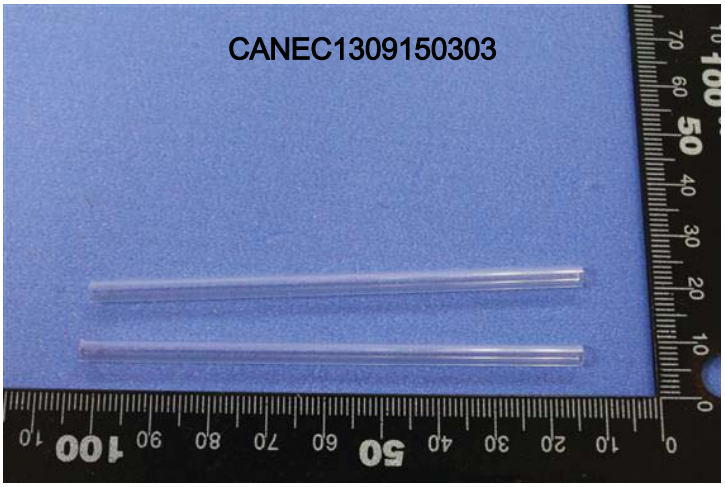
ATTACHMENTS

RoHS Testing Flow Chart

1) Name of the person who made testing: Michael Tso / Cutey Yu
2) Name of the person in charge of testing: Adams Yu / Yolanda Wei
3) These samples were dissolved totally by pre -conditioning method according to below flow chart (Cr^{6+} and PBBs/PBDEs test method excluded).



Sample photo:



CAN13-091503.002

SGS authenticate the photo on original report only

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Test Report

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

LITTELFUSE PHILIPPINES INC.
LIMA TECHNOLOGY CENTER, LIPA CITY,
MALVAR, BATANGAS

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

SGS Job No. :	XM14644726EC - XM
Date of Sample Received :	18 Jun 2013
Testing Period :	18 Jun 2013 - 24 Jun 2013
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS-CSTC Ltd.

Almay Gao
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	CAN13-091503.001	Transparent glass tube

Remarks :

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method : With reference to IEC 62321:2008

(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	142
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 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

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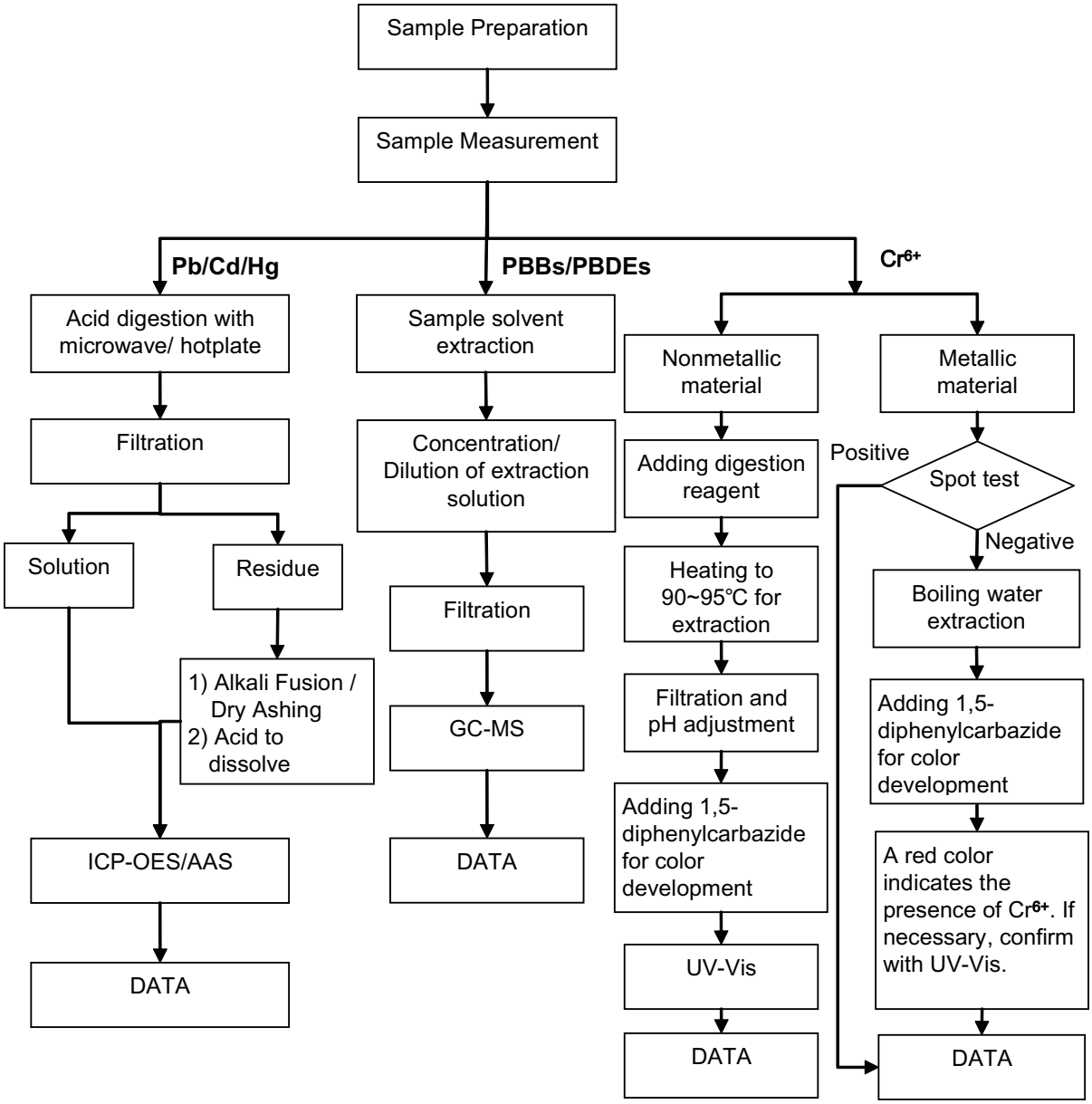
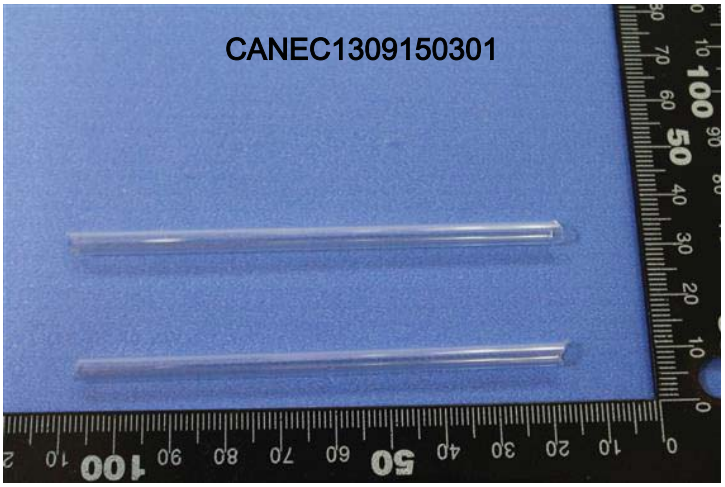
ATTACHMENTS

RoHS Testing Flow Chart

1) Name of the person who made testing: Michael Tso / Cutey Yu
2) Name of the person in charge of testing: Adams Yu / Yolanda Wei
3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr^{6+} and PBBs/PBDEs test method excluded).



Sample photo:



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