

### **ICP Test Report Certification Packet**

Company name:	Littelfuse, Inc.
Product Series:	5x20 Cartridge Fuse
Product #:	217P Series
Issue Date:	July 25, 2012
2011/65/EU)-restricted s packing/packaging mater In addition, it is hereby refor unit parts, the packing.	Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC, ubstance nor such use, for materials to be used for unit parts, for ials, and for additives and the like in the manufacturing processes. ported to you that the parts and sub-materials, the materials to be used packaging materials, and the additives and the like in the manufacturing sed of the following components.
	Issued by: KRISTEEN BACILA <global ehs="" engineer=""></global>
(1) Parts, sub-materials a This document cov Littelfuse, Inc.	-
< Raw Materials L Please see Tab	
(2) The ICP data on all Please see app	measurable substances propriate 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	C910541	Cap	3-6
2	C910510	Сар	3-6
3	C909543	Body – Soda Lime Glass	7-11
4	082xxx	Element - Ag Plated Wires	12-21
5	687xxx	Element - Copper Cladded Wires	22-31
6	YTW206 (692529)	Solder	32-36
7	YTW102 (692535-002)	Solder	37-41
8	3M-3779-PG (087244)	HMA (RoHS & Halogens)	42-50
9	EP608 (087335)	Glue (RoHS & Halogens)	51-62
10	030204	Overcap (Cap base & plating) Overcap (Cap wire base & plating)	63-66
11	934-077 (C030208)	Overcap (Cap base & plating) Overcap (Cap wire base & plating)	63-66
12	C030210	Overcap (Cap base & plating) Overcap (Cap wire base & plating)	63-66
13	425901	Ink - Red	67-81
14	425902	Ink - Black	82-96
15	425903	Ink - Yellow	97-111
16	425904	Ink - Blue	112-125
17	425906	Ink - Brown	126-140
18	425907	Ink - Green	141-155
19	425909	Ink - Grey	156-170
20	425913	Ink - Pale Blue	171-185



NO.: A002E11121307-1R02 Date: Dec.15, 2011 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: / Description: / Buyer: / Supplier: /

Manufacturer: /

Sample received date: Dec.13,2011

Testing period: From Dec.13,2011 to Dec.15,2011

#### **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:

### 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)\*\*\*\*\*\*

Approved by

(Lab manager)

Project Leader
(Engineer)

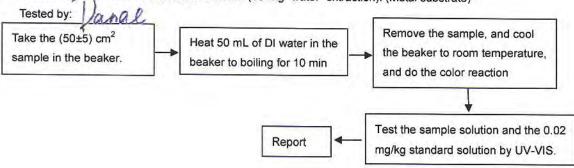
Inspected by
(Technical manager) Weikin

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

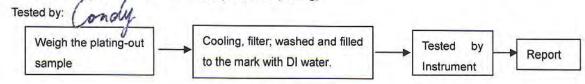


NO.: A002E11121307-1R02 Date: Dec.15, 2011 Page 2 of 4

Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: Weigh the sample into Add the digestion solution: the Add H2O2 until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Report Tested by ICP-OES filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) Tested by:/ onoul Weigh the sample The sample is digested in the Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate)



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



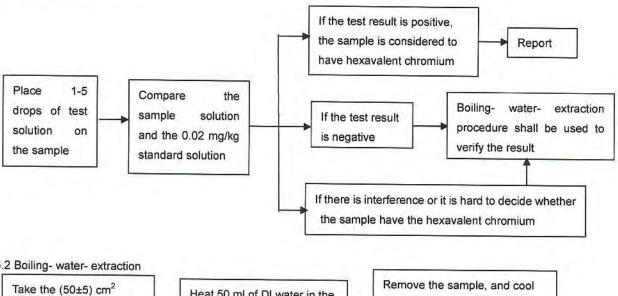


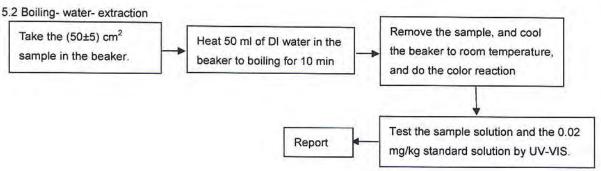


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5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating)
Tested by:

5.1 Spot-test





#### Test Results:

Item	Unit	RoHS	Result		
		Limit	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	





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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\*\*\*





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 Results:

#### Test Part Description:

Specimen No. SGS Sample ID Description

CAN12-079122.001 Trans

Transparent glass tube

#### Remarks:

1

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	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	4	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	0-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	2.1	mg/kg	5	ND
Heptabromobiphenyl	35	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	r i je	mg/kg	5	ND
Decabromobiphenyl	Q.	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. CANEC1207912201		Date: 26	Jun 2012	Page 3 of 5
Test Item(s)	Limit	<u>Unit</u>	MDL	<u>001</u>	
Dibromodiphenyl ether	4	mg/kg	5	ND	
Tribromodiphenyl ether	(a)	mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether	2	mg/kg	5	ND	
Hexabromodiphenyl ether	2	mg/kg	5	ND	
Heptabromodiphenyl ether	77	mg/kg	5	ND	
Octabromodiphenyl ether	*	mg/kg	5	ND	
Nonabromodiphenyl ether	u <del>ž</del> o.	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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No. CANEC1207912201

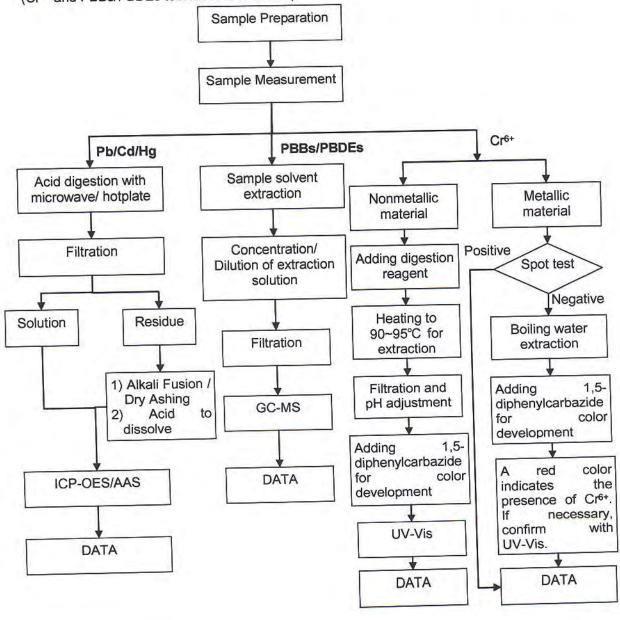
Date: 26 Jun 2012

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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 (Cr6+ and PBBs/PBDEs test method excluded).



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Sample photo:



SGS authenticate the photo on original report only

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



Validity unknown
For Question
Please Contact with SGS
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測試報告 Test Report

號碼(No.): CE/2012/10835 日期(Date): 2012/01/11 頁數(Page): 1 of 10

ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU GMBH GEWERBESTRASSE 87, D-98669 VEILSDORF, GERMANY



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

樣品名稱(Sample Description)

: SILVER PLATED & PURE SILVER WIRES

樣品型號(Style/Item No.)

: 請參考第5頁 (PLEASE REFER TO PAGE 5)

原產國(Country of Origin)

: 德國 (GERMANY)

收件日期(Sample Receiving Date)

: 2012/01/04

測試期間(Testing Period)

: 2012/01/04 TO 2012/01/11

測試結果(Test Results)

: 請見下一頁 (Please refer to next pages).



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號碼(No.): CE/2012/10835

日期(Date): 2012/01/11

頁数(Page): 2 of 10

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#### 測試結果(Test Results)

測試部位(PART NAME) No.1: 混測所有顏色金屬線 (含鍍層) (共6款) (MIXED ALL COLOR METAL WIRE (INCLUDING THE PLATING LAYER) (6 TYPES))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) No.1
爾 / Cadmium (Cd) mg/kg 参考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.
紹 / Lead (Pb) mg/kg 参考IEC 62321: 2008方法,以感應耦合電漿原子發射光譜儀絵測. / With reference to IEC 62321: 2008 and performed by ICP-AES.		2	n.d.	
汞 / Mercury (Hg)	mg/kg	参考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.
六價絡 / Hexavalent Chromium Cr(VI)	**	參考IEC 62321: 2008方法,以沸水萃取法檢測. / With reference to IEC 62321: 2008 and performed by Boiling water extraction Method.#	#	Negative
無辛烷磺酸 / Perfluorooctane mg/kg 参考US EPA 3540C: 1996方法、以液 Ilfonates (PFOS-Acid, Metal Salt, nide) mg/kg 参考US EPA 3540C: 1996方法、以液 相層析質譜儀絵測全氣辛烷磺酸含量. / With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.		10	n.d.	
全氟辛酸(銨) / PFOA (CAS No.: 335-67- 1)	mg/kg	参考US EPA 3540C: 1996方法,以液相層析質譜儀檢測全氟辛酸(銨)含量. / With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) No.1
多溴聯苯總和 / Sum of PBBs			-	n.d.
一溴聯苯 / Monobromobiphenyl		1	5	n.d.
二溴聯苯 / Dibromobiphenyl			5	n.d.
三溴聯苯 / Tribromobiphenyl			5	n.d.
四溴聯苯 / Tetrabromobiphenyl			5	n.d.
五溴聯苯 / Pentabromobiphenyl			5	n.d.
六溴聯苯 / Hexabromobiphenyl		[[ ]	5	n.d.
七溴聯苯 / Heptabromobiphenyl			5	n.d.
へ溴聯苯 / Octabromobiphenyl			5	n.d.
九溴聯苯 / Nonabromobiphenyl		参考IEC 62321: 2008方法, 以氣相層	5	n.d.
十溴聯苯 / Decabromobiphenyl	mg/kg	析儀/質譜儀檢測. / With reference	5	n.d.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	to IEC 62321: 2008 and performed		n.d.
一溴聯苯醚 / Monobromodiphenyl ether		by GC/MS.	5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether			5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether			5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether			5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether			5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether		V 31	5	n.d.
へ溴聯苯醚 / Octabromodiphenyl ether		1.3	5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether			5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether		p.	5	n.d.
鹵素 / Halogen				
鹵素 (氣) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)			50	n.d.
鹵素 (氣) / Halogen-Chlorine (C1) (CAS No.: 22537-15-1)		参考BS EN 14582:2007, 以離子層析 儀分析. / With reference to BS EN	50	n.d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(碘)/ Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

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ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU GMBH GEWERBESTRASSE 87, D-98669 VEILSDORF, GERMANY

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#### 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. \*\*= Qualitative analysis (No Unit) 定性分析(無單位)
- 6.# = a. Positive means the presence of CrVI on the tested areas (Positive表示測試區域偵測到六價鉻)
  - b. Negative means the absence of CrVI on the tested areas (Negative表示測試區域未偵測到六價鉻)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas. / 該溶液濃度≧0.02 mg/kg with 50 cm² (tested areas)

7. 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别單一材質的含量. (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.)

### PFOS参考資訊(Reference Information): 指令 2006/122/EC (Directive 2006/122/EC)

- (1) 該物質不可置於市場上或使用於特殊物質或配置成分重量濃度等於或大於0.005%.
  (May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.)
- (2) 該物質不可置於市場上的半成品或商品或其物件; 假若零件上明顯地具有PFOS並參照結構上及微細構造上計算PFOS重量 濃度等於或大於0.1%, 而紡織品或其他覆蓋物質, 如果PFOS在覆蓋物質中含量等於或大於1µg/m².

  (May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg/m² of the coated material.)

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樣品型號(Style/Item No.)

(B-1) 101. 014 - . - - - - - silver plated copper wire-Cu, Ag - - %

(B-2) 101. 0131. - - - - - pure silver wire-Ag 1000

(B-3) 101.0123.0 - - - - silver plated purest nickel wire-Ni99.98%, Ag1%

(B-4) 101.0182.0 - - - - silver-copper alloy plated copper clad wire-Elcon D, AgCu5%

(B-5) 101.0120.0 - - - - silver plated constantan wire-CuNi44, Ag5%

(B-6) 101.0151.0 - - - - copper - nickel 44 alloy silver plated wire-CuNi44, Ag10%

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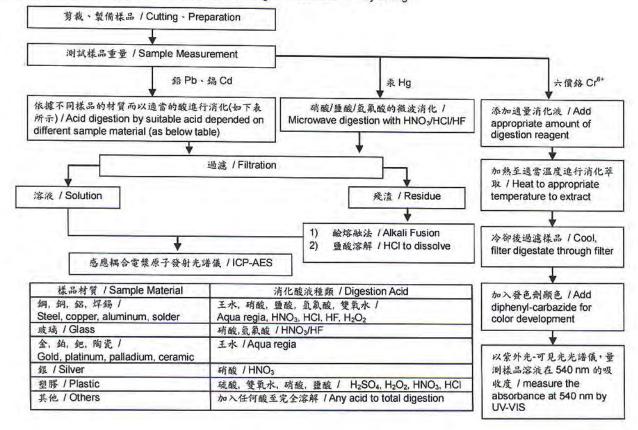
號碼(No.): CE/2012/10835

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ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU GMBH GEWERBESTRASSE 87, D-98669 VEILSDORF, GERMANY

- 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>8+</sup> test method excluded)
- 2) 测试人员:楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 测試負責人: 張啓典 / Name of the person in charge of measurement: Troy Chang



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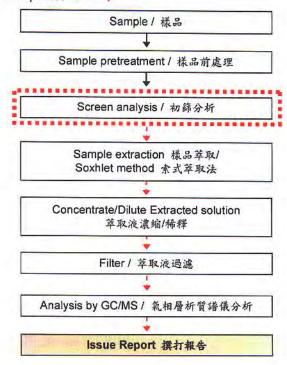
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### 多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 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

確認程序 / Confirmation process - - - →



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Company and Jan 2011 Lant Market Hands the Translation of Service printed overleaf, available on request or accessible at www.sgs.com/terms\_and\_conditions.htm and. for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms\_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



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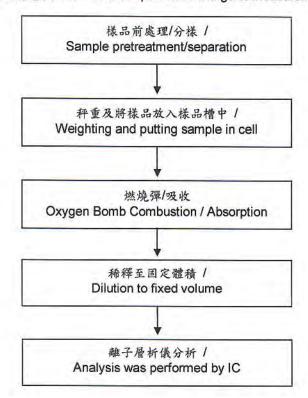
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### 鹵素分析流程圖 / Analytical flow chart of halogen content

- 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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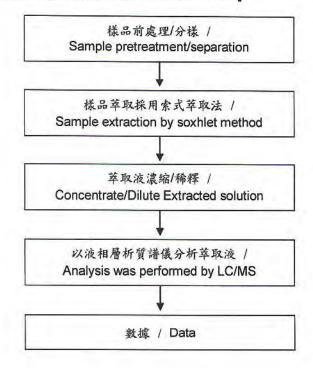
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### 索式萃取分析流程圖 / Analytical flow chart of Soxhlet extraction (LC/MS) procedure

- 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

【測試項目:全氟辛烷磺酸/全氟辛酸(銨)、苯並三唑類化合物 / Test Items: PFOS/PFOA、Benzotriazole】



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\* 照片中如有箭頭標示,則表示爲實際檢測之樣品/部位. \*

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

CE/2012/10835



CE/2012/10835



\*\* 報告結尾(End of Report) \*\*

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

樣品名稱(Sample Description)

COPPER CLAD & COPPER ALLOY WIRES

樣品型號(Style/Item No.)

: 請參考第5頁 (PLEASE REFER TO PAGE 5)

原產國(Country of Origin)

: 德國 (GERMANY)

收件日期(Sample Receiving Date)

: 2012/01/04

測試期間(Testing Period)

2012/01/04 TO 2012/01/11

測試結果(Test Results)

: 請見下一頁 (Please refer to next pages).



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#### 測試結果(Test Results)

測試部位(PART NAME) No.1: 混測所有顏色金屬線 (含鍍層) (共16款) (MIXED ALL COLOR METAL WIRE (INCLUDING THE PLATING LAYER) (16 TYPES))

測試項目 單位 測試方法 (Unit) (Method)		方法偵測 極限値 (MDL)	結果 (Result) No.1	
鎬 / Cadmium (Cd)	mg/kg	mg/kg 参考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.		n.d.
鉛 / Lead (Pb)  mg/kg 参考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.	
系 / Mercury (Hg)	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.	#	n.d.
六價络 / Hexavalent Chromium Cr(VI)	**	參考IEC 62321: 2008方法,以沸水萃取法檢測. / With reference to IEC 62321: 2008 and performed by Boiling water extraction Method.#		Negative
全氣辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)  mg/kg 参考US EPA 3540C: 1996方法, 以液相層析質譜儀檢測全氣辛烷磺酸含量 / With reference to US EPA 3540C 1996 method for PFOS Content. Analysis was performed by LC/MS.		10	n.d.	
全氟辛酸(銨) / PFOA (CAS No.: 335-67- 1)	mg/kg	參考US EPA 3540C: 1996方法,以液相層析質譜儀檢測全氟辛酸(銨)含量. / With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.

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測試項目 (Test Items)	測試項目 単位 測試方法		方法偵測 極限値 (MDL)	結果 (Result) No.1
多溴聯苯總和 / Sum of PBBs			2	n.d.
一溴聯苯 / Monobromobiphenyl		10	5	n.d.
二溴聯苯 / Dibromobiphenyl		1	5	n.d.
三溴聯苯 / Tribromobiphenyl		1 9	5	n.d.
四溴聯苯 / Tetrabromobiphenyl			5	n.d.
五溴聯苯 / Pentabromobiphenyl			5	n.d.
六溴聯苯 / Hexabromobiphenyl			5	n.d.
七溴聯苯 / Heptabromobiphenyl			5	n.d.
八溴聯苯 / Octabromobiphenyl			5	n.d.
九溴聯苯 / Nonabromobiphenyl		参考IEC 62321: 2008方法, 以氣相層	5	n.d.
十溴聯苯 / Decabromobiphenyl	11:	析儀/質譜儀檢測. / With reference	5	n.d.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	to IEC 62321: 2008 and performed		n.d.
一溴聯苯醚 / Monobromodiphenyl ether		by GC/MS.	5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether			5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether			5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether			5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether			5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether			.5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether			5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether			5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether			5	n.d.
鹵素 / Halogen			E E E 1	
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)			50	n.d.
鹵素 (氣) / Halogen-Chlorine (C1) (CAS No.: 22537-15-1)		参考BS EN 14582:2007, 以離子層析 儀分析. / With reference to BS EN	50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	14582:2007. Analysis was performed by IC.	50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

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#### 備註(Note):

- 1. mg/kg = ppm ; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限値)
- 4. "-" = Not Regulated (無規格值)
- 5. \*\*= Qualitative analysis (No Unit) 定性分析(無單位)
- 6.# = a. Positive means the presence of CrVI on the tested areas (Positive表示測試區域偵測到六價鉻)
  - b. Negative means the absence of CrVI on the tested areas (Negative表示測試區域未偵測到六價鉻)

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² tested areas. / 該溶液濃度≥0.02 mg/kg with 50 cm² (tested areas)

7. 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别單一材質的含量.
(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.)

### PFOS參考資訊(Reference Information): 指令 2006/122/EC (Directive 2006/122/EC)

- (1) 該物質不可置於市場上或使用於特殊物質或配置成分重量濃度等於或大於0.005%.
  (May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.)
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  (May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg/m² of the coated material.)

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號碼(No.): CE/2012/10836 日期(Date): 2012/01/11 頁數(Page): 5 of 10

ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU GMBH GEWERBESTRASSE 87, D-98669 VEILSDORF, GERMANY



```
樣品型號(Style/Item No.)
     (C-1) 101. 0177. 0 - - - -
                                copper tin alloy wire CuSn6
     (C-2) 101. 0183. 0 - - - -
                               copper clad wire - Elcon 30
     (C-3) 101. 0172. 0 - - - - copper clad steel wire - Elcon F
     (C-4) 101. 0181. 0 - - - -
                                copper clad iron-nickel-alloy wire - Elcon D
     (C-5) 101.0132. - - - - silver copper alloy wire - AgCu50
     (C-6) 101.0134. 0 - - - - silver copper alloy wire - AgCu90
     (C-7) 101.0171. 0 - - - copper wire - Cu99.9%
     (C-8) 101.0135. - - - - silver copper alloy wire - Ag72Cu28
     (C-9) 101.0157. 0 - - - copper-zinc-alloy wire - Cu80 Zn20
                               silver copper alloy wire - Ag45Cu55 (AgCu55)
     (C-10) 101.0136. - - - - -
     (C-11) 101- - 064. - - - - copper plated, brass plated spring-steel wire - FST, Cu--%
     (C-12) 101.0166. - - - - silver copper alloy wire - AgCu70 (ElCu70)
     (C-13) 101.0138. - - - - silver copper alloy wire - AgCu80 (EICu80)
     (C-14) 101.0161. - - - - oxygenfree copper wire - OF-Cu
     (C-15) 101.0155. 0 - - - - copper-zinc-alloy wire - Cu70 Zn30 (Ms 70)
     (C-16) 101.0128. 0 - - - - - tungsten purity wire - W
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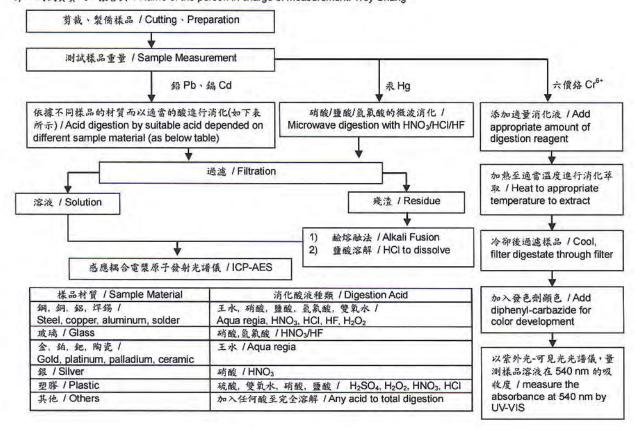
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ELSCHUKOM ELEKTROSCHUTZKOMPONENTENBAU GMBH GEWERBESTRASSE 87, D-98669 VEILSDORF, GERMANY



- 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) 测試負責人:張啓與 / Name of the person in charge of measurement: Troy Chang



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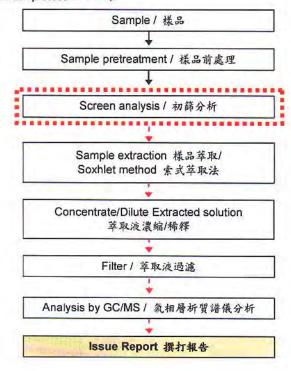
#### 多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 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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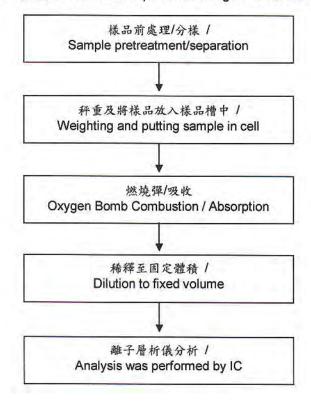
頁数(Page): 8 of 10

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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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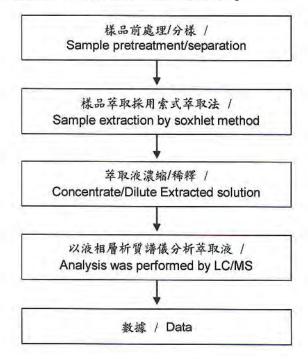
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#### 索式萃取分析流程圖 / Analytical flow chart of Soxhlet extraction (LC/MS) procedure

- 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

【测試項目:全氯辛烷磺酸/全氯辛酸(銨)、苯並三唑類化合物 / Test Items: PFOS/PFOA、Benzotriazole】



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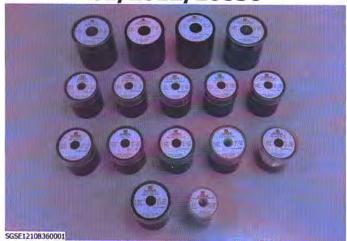
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\* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. \*

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

CE/2012/10836



CE/2012/10836



\*\* 報告結尾(End of Report) \*\*

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Test Report No. SHAEC1116009840 Date: 14 Oct 2011 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. : SP11-030781 - SH

Model No.: YTW206

Composition: Sn0.3Ag0.7CuCe

Date of Sample Received: 09 Oct 2011

Testing Period: 09 Oct 2011 - 13 Oct 2011

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

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

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

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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No. SHAEC1116009840

Date: 14 Oct 2011

Page 2 of 5

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

SHA11-160098.035

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)	<u>Limit</u>	Unit	MDL	035
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	41
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	4	77.2	$\Diamond$	Negative
Sum of PBBs	1,000	mg/kg	- 15	ND
Monobromobiphenyl	1 7 2	mg/kg	5	ND
Dibromobiphenyl	74	mg/kg	5	ND
Tribromobiphenyl	14	mg/kg	5	ND
Tetrabromobiphenyl		mg/kg	5	ND
Pentabromobiphenyl	-4	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. SHAEC1116009840		Date: 14	Oct 2011	Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>035</u>	
Dibromodiphenyl ether	1.21	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	(9)	mg/kg	5	ND	
Pentabromodiphenyl ether	4	mg/kg	5	ND	
Hexabromodiphenyl ether	12	mg/kg	5	ND	
Heptabromodiphenyl ether	16.	mg/kg	5	ND	
Octabromodiphenyl ether	i i	mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	4	mg/kg	5	ND	

#### Notes:

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

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

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

◇ Boiling-water-extraction:

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

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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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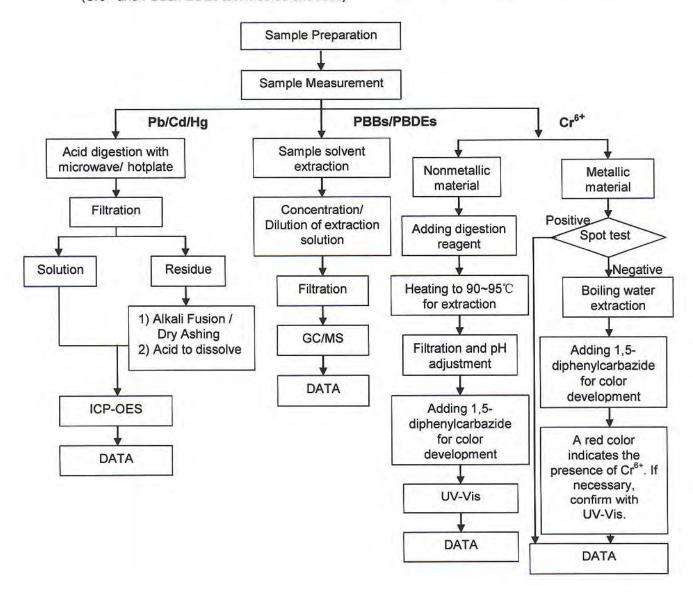
Date: 14 Oct 2011

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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/ Elim Lin
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ and PBBs/PBDEs test method excluded)



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No. SHAEC1116009840

Date: 14 Oct 2011

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Sample photo:



SGS authenticate the photo on original report only

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No. SHAEC1116009838

Date: 14 Oct 2011

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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. : SP11-030781 - SH

Model No.: YTW102(692535-001,692535-002,692535-003)

Composition : Sn2.0CuRE

Date of Sample Received : 09 Oct 2011

Testing Period: 09 Oct 2011 - 13 Oct 2011

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

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

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

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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No. SHAEC1116009838

Date: 14 Oct 2011

Page 2 of 5

Test Results:

Test Part Description:

Specimen No. SGS Sample ID

Description

1

SHA11-160098.033

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)	<u>Limit</u>	<u>Unit</u>	MDL	033
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	167
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	$\Diamond$	Negative
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	•	mg/kg	5	ND
Dibromobiphenyl	+	mg/kg	5	ND
Tribromobiphenyl	1 - 2	mg/kg	5	ND
Tetrabromobiphenyl	, -	mg/kg	5	ND
Pentabromobiphenyl	1.57	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	1 <del>2</del>	mg/kg	5	ND
Nonabromobiphenyl		mg/kg	5	ND
Decabromobiphenyl		mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	- 1	mg/kg	5	ND

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Test Report	No. SHAEC11160098	38	Date: 14	Oct 2011	Page 3 of 5
Test Item(s)	Limit	<u>Unit</u>	MDL	<u>033</u>	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether	, P	mg/kg	5	ND	
Tetrabromodiphenyl ether	194.9	mg/kg	5	ND	
Pentabromodiphenyl ether	0.0	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether		mg/kg	5	ND	
Octabromodiphenyl ether	w.	mg/kg	5	ND	
Nonabromodiphenyl ether	( ( <del>)</del>	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 CrVI coating, Positive = Presence of CrVI coating;

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

Boiling-water-extraction:

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

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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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No. SHAEC1116009838

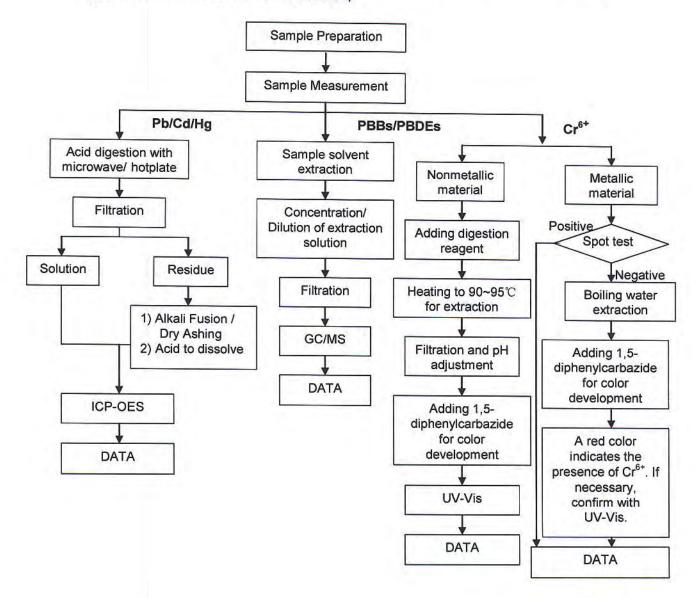
Date: 14 Oct 2011

Page 4 of 5

### **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/ Elim Lin
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ and PBBs/PBDEs test method excluded)



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No. SHAEC1116009838

Date: 14 Oct 2011

Page 5 of 5

Sample photo:



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No. SHAEC1119525001

Date: 07 Dec 2011

Page 1 of 5

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.: SP11-036760 - SH

Date of Sample Received: 03 Dec 2011

Testing Period: 03 Dec 2011 - 07 Dec 2011

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

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

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

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1119525001

Date: 07 Dec 2011

Page 2 of 5

Test Results:

**Test Part Description:** 

Specimen No.

SGS Sample ID

Description

1

SHA11-195250.001

Yellow 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.

<u>Limit</u>	<u>Unit</u>	MDL	001
100	mg/kg	2	ND
1,000	mg/kg	2	ND
1,000	mg/kg	2	ND
1,000	mg/kg	2	ND
1,000	mg/kg	1,21	ND
-	mg/kg	5	ND
2	mg/kg	5	ND
9.	mg/kg	5	ND
O <del>l</del>	mg/kg	5	ND
4	mg/kg	5	ND
-	mg/kg	5	ND
4	mg/kg	5	ND
	mg/kg	5	ND
C- <del>2</del> 0	mg/kg	5	ND
φ.	mg/kg	5	ND
1,000		-	ND
	mg/kg	5	ND
	100 1,000 1,000 1,000 - - - - - -	100 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg 1,000 mg/kg - mg/kg	100 mg/kg 2 1,000 mg/kg -

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If the survive stated the results shown in this test report refer only to the sample(e) tested.

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Test Report	No. SHAEC11195250	01	Date: 07	Dec 2011	Page 3 of 5
Test Item(s)	Limit	<u>Unit</u>	MDL	001	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether	( <del>4</del> 1	mg/kg	5	ND	
Tetrabromodiphenyl ether	1 (8)	mg/kg	5	ND	
Pentabromodiphenyl ether	A)	mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether	4.	mg/kg	5	ND	
Octabromodiphenyl ether	O.	mg/kg	5	ND	
Nonabromodiphenyl ether	2	mg/kg	5	ND	
Decabromodiphenyl ether	1947	mg/kg	5	ND	

### Notes:

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

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No. SHAEC1119525001

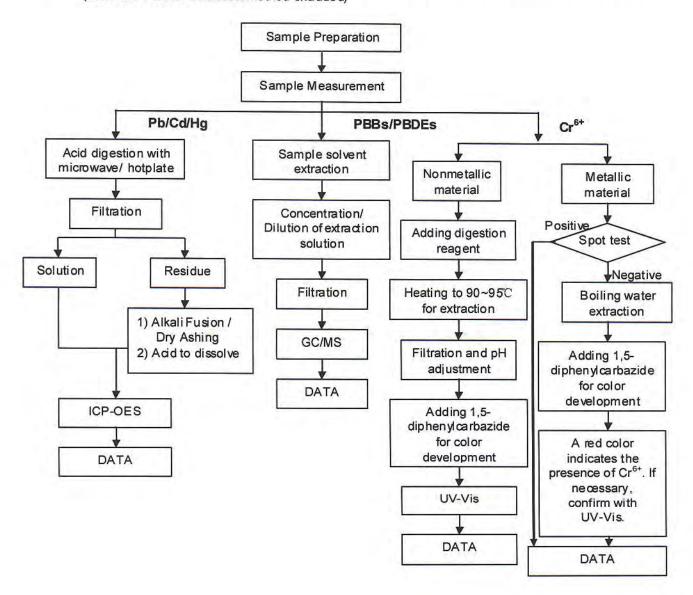
Date: 07 Dec 2011

Page 4 of 5

## **ATTACHMENTS**

## **RoHS Testing Flow Chart**

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



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No. SHAEC1119525001

Date: 07 Dec 2011

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Sample photo:



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No. SHAEC1119525002

Date: 07 Dec 2011

Page 1 of 4

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. : SP11-036760 - SH

Date of Sample Received: 03 Dec 2011

Testing Period: 03 Dec 2011 - 07 Dec 2011

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

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

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

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ

Approved Signatory

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No. SHAEC1119525002

Date: 07 Dec 2011

Page 2 of 4

Test Results:

Test Part Description:

Specimen No. SGS Sample ID

Description

1

SHA11-195250.001

Yellow solid

Remarks:

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

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

### Halogen

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

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

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No. SHAEC1119525002

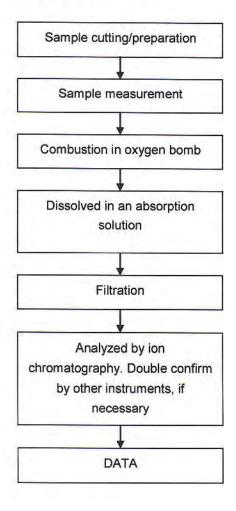
Date: 07 Dec 2011

Page 3 of 4

## **ATTACHMENTS**

## **Halogen Testing Flow Chart**

- 1) Name of the person who made testing: Daisy Gong
- 2) Name of the person in charge of testing: Alex Jiang



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No. SHAEC1119525002

Date: 07 Dec 2011

Page 4 of 4

Sample photo:



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No. TSNEC1200272601

Date: 09 Apr 2012

Page 1 of 8

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

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

SGS Job No.:

TP12-004950 - TJ

Model No.:

**EP608** 

Date of Sample Received:

31 Mar 2012

Testing Period:

31 Mar 2012 - 09 Apr 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

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.

Aimy Wang

Approved Signatory

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No. TSNEC1200272601

Date: 09 Apr 2012

Page 2 of 8

Test Results:

#### Test Part Description:

Specimen No. SGS Sample ID Description TSN12-002726.001 1 ivory-white paste

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)	<b>Limit</b>	<u>Unit</u>	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	4	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	0-0	mg/kg	5	ND
Tetrabromobiphenyl	40	mg/kg	5	ND
Pentabromobiphenyl	1 <u>1</u>	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl		mg/kg	5	ND
Octabromobiphenyl		mg/kg	5	ND
Nonabromobiphenyl	1.0	mg/kg	5	ND
Decabromobiphenyl	. 4	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	,2	ND
Monobromodiphenyl ether	1.9	mg/kg	5	ND

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Test Report	No. TSNEC120027260	01	Date: 09	Apr 2012	Page 3 of 8
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	001	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	40	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	ė.	mg/kg	5	ND	
Heptabromodiphenyl ether	000	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	181	mg/kg	5	ND	
Decabromodiphenyl ether	ů.	mg/kg	5	ND	

#### Notes:

## Hexabromocyclododecane (HBCDD)

Test Method: With reference to IEC 62321:2008, analysis was performed by GC-MS.

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

#### Notes:

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

### **Phthalates**

Test Method: With reference to EN14372: 2004, analysis was performed by GC-MS.

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

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

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



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Date: 09 Apr 2012

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Result shown is of the total weight of wet sample

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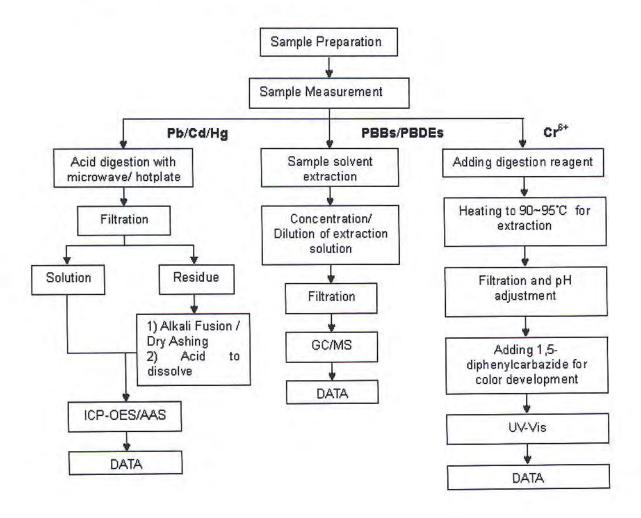
Date: 09 Apr 2012

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### **ATTACHMENTS**

## Cd/Pb/Hg/Cr<sup>S+</sup>/PBBs&PBDEs Flow Chart

- 1) Name of the person who made testing: Aaron Wang/Jason Li /Angell Yao
- 2) Name of the person in charge of testing: Cindy Yin/Rex Zhu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr8+ and PBBs/PBDEs test method excluded)



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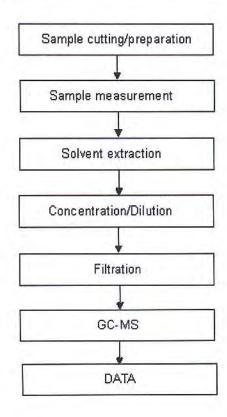
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#### **ATTACHMENTS**

## **HBCDD Testing Flow Chart**

- 1) Name of the person who made testing: Marina Sun
- 2) Name of the person in charge of testing: Rex Zhu



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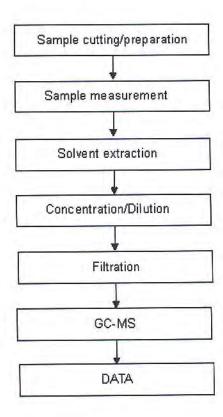
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### **ATTACHMENTS**

## Phthalate Testing Flow Chart

1) Name of the person who made testing: Marina Sun

2) Name of the person in charge of testing: Rex Zhu



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Sample photo:



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No. TSNEC1200272602

Date: 09 Apr 2012

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

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

SGS Job No.:

TP12-004950 - TJ

Model No.:

**EP608** 

Date of Sample Received:

31 Mar 2012

Testing Period:

31 Mar 2012 - 09 Apr 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

Aimy Wang

Approved Signatory

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Date: 09 Apr 2012

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Test Results:

### Test Part Description:

Specimen No.

SGS Sample ID

Description

TSN12-002726.002

ivory-white paste

#### 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).

<u>Unit</u>	MDL	002
mg/kg	50	57
mg/kg	50	7557
mg/kg	50	ND
mg/kg	50	ND
	mg/kg mg/kg mg/kg	mg/kg 50 mg/kg 50 mg/kg 50

Result shown is of the total weight of wet sample

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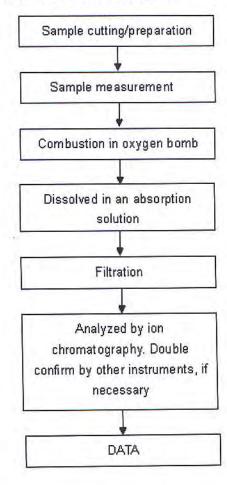
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### **ATTACHMENTS**

## Halogen Testing Flow Chart

- 1) Name of the person who made testing: Angell Yao
- 2) Name of the person in charge of testing: Rex Zhu



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Sample photo:



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NO.: A002E11121307-2R02 Date: Dec.15, 2011 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: Fuses copper shell

Model: /

Item/Lot No.: / Material: / Description: /

Buyer: / Supplier: / Manufacturer: /

Sample received date: Dec.13,2011

Testing period: From Dec.13,2011 to Dec.15,2011

#### **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*

### 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)\*\*\*\*\*\*

Approved by

Project Leader Muggie
(Engineer)

Inspected by
(Technical manager) Weikin

(Lab manager)



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



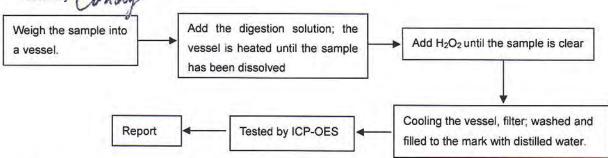
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Date: Dec.15, 2011

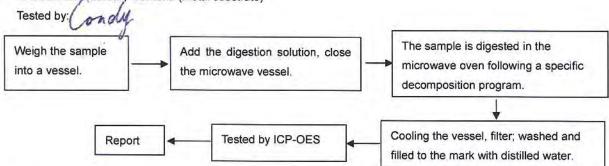
Page 2 of 4

#### Test Flow:

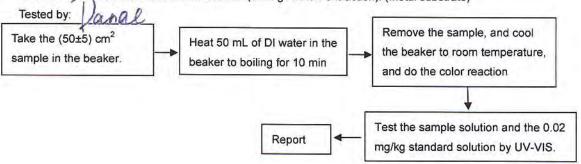
To Determine Lead, Cadmium Content: (Metal substrate)
 Tested by:



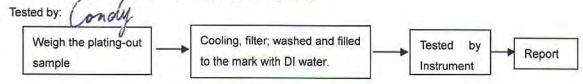
2. To Determine Mercury Content: (Metal substrate)



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



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



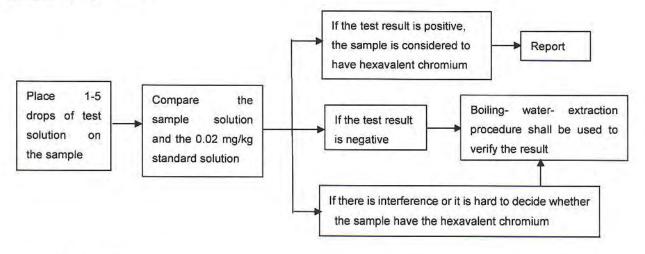


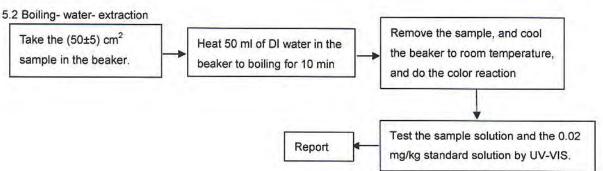


NO.: A002E11121307-2R02 Date: Dec.15, 2011 Page 3 of 4

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

5.1 Spot-test





## Sample description:

Code	Sample name	Code	Sample name
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.	2.5	40.0	N.D.
Cadmium (Cd)	mg/kg	100	N.D.	N.D.	N.D.	N.D.
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Chromium (CrVI)	mg/kg	1000	Negative	Negative	Negative	Negative





NO.: A002E11121307-2R02

Date: Dec.15, 2011

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#### Note:

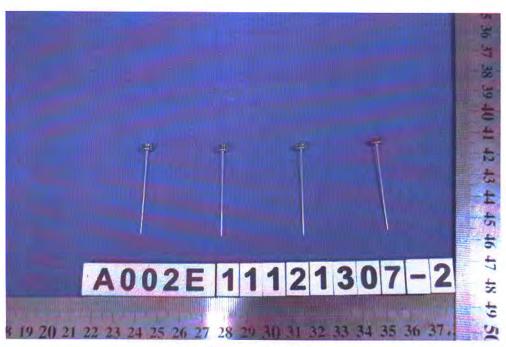
- -The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.
- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -mg/kg=ppm
- -N.D.=not 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



Fuses copper shell

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





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TEST REPORT

NUMBER: SHAH00287553

DATE: NOV 01, 2011

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be: Red ink.

Part Description : Ink - red. Part Number : 425901.

Date Sample Received : Oct.25, 2011.
Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY:
FOR INTERTEK TESTING SERVICES
LTD., SHANGHAI

myr

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

FOR INTERTEK TESTING SERVICES

LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287553

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)	
		(MAX.)	
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT



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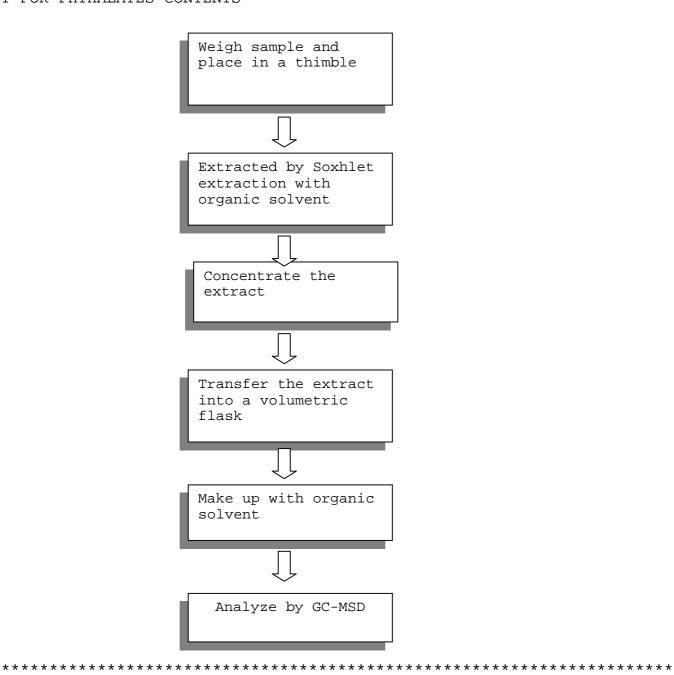
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NUMBER: SHAH00287553

## TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287553

TESTS CONDUCTED

## 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	720
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

## (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



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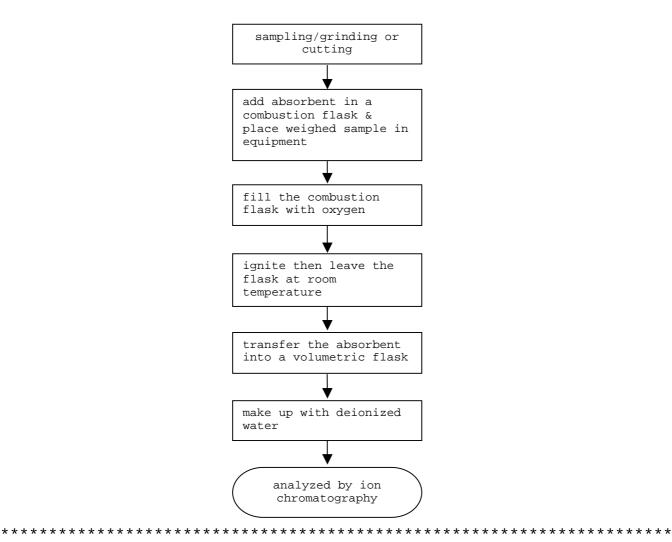
NUMBER: SHAH00287553

## TEST REPORT

TESTS CONDUCTED

## (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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TEST REPORT NUMBER: SHAH00287553

TESTS CONDUCTED

## 3 (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 <sup>6+</sup> ) 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

\*



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NUMBER: SHAH00287553

### TEST REPORT

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

#### (II) RoHS Requirement:

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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#### TEST REPORT

NUMBER: SHAH00287553

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 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



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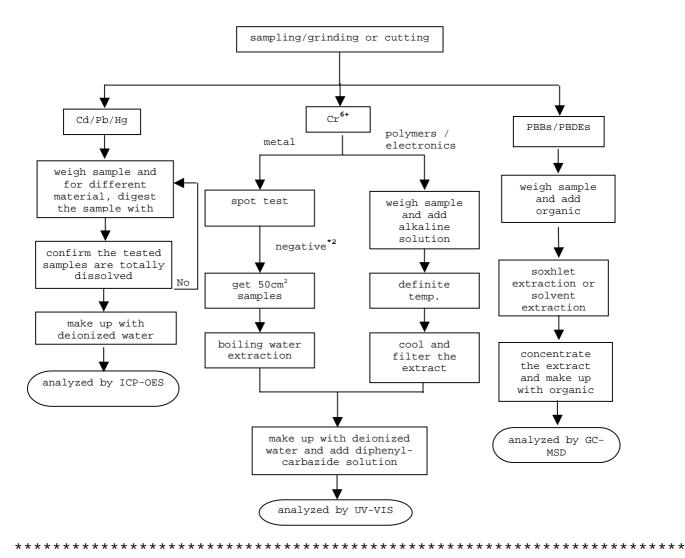
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NUMBER: SHAH00287553

#### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

NUMBER: SHAH00287553

TESTS CONDUCTED

#### **REMARKS:**

\*1: List of appropriate acid:

Material	Acid added for digestion
Polymers	$HNO_3$ , $HC1$ , $HF$ , $H_2O_2$ , $H_3BO_3$
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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TEST REPORT NUMBER: SHAH00287553

TESTS CONDUCTED

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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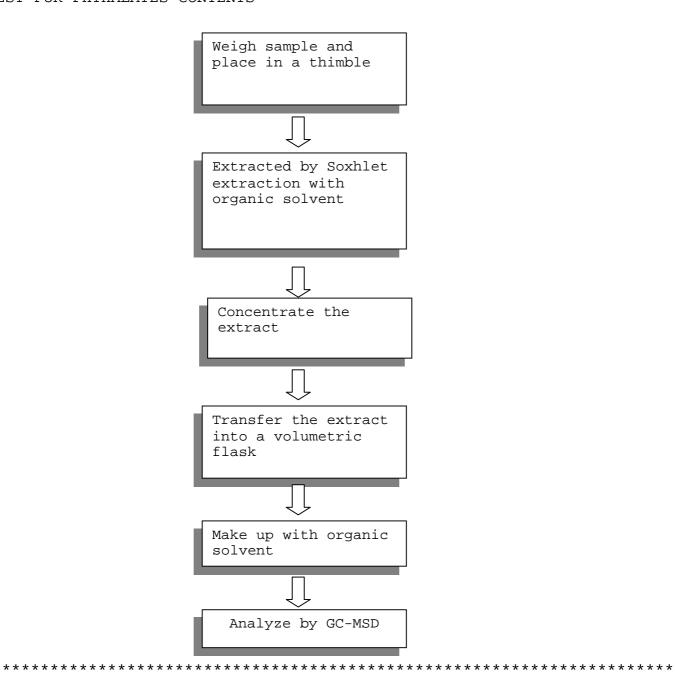
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#### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287553

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

### REMARKS:

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.31, 2011



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NUMBER: SHAH00287553

#### TEST REPORT

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

\*



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TEST REPORT

NUMBER: SHAH00287553

TESTS CONDUCTED



END OF REPORT



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TEST REPORT

NUMBER: SHAH00287569

DATE: OCT 31, 2011

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be Black ink.

Part Description : Ink - black.

Part Number : 425902.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY:
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/

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287569

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT



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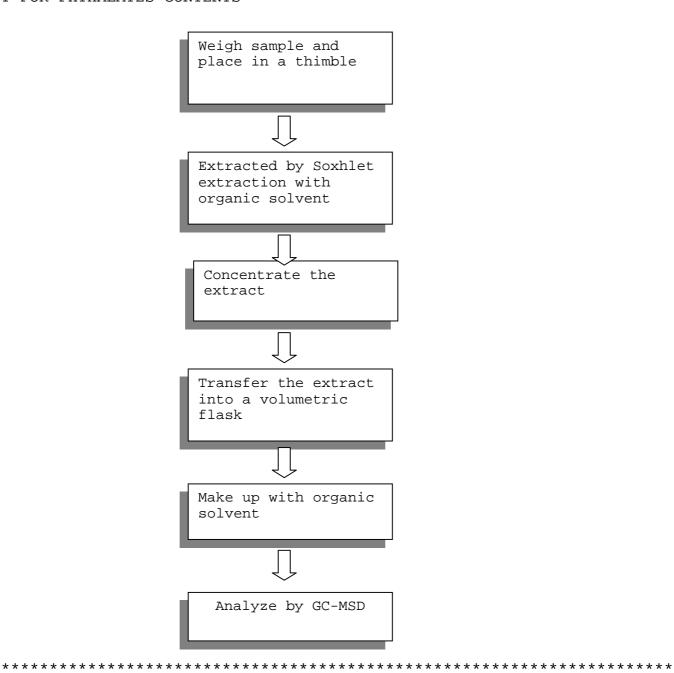
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#### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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#### TEST REPORT NUMBER: SHAH00287569

TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

#### (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



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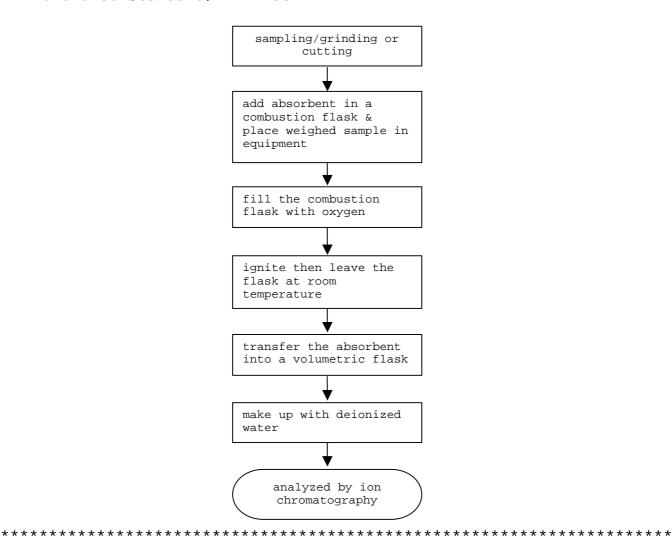
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#### TEST REPORT

TESTS CONDUCTED

#### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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TEST REPORT NUMBER: SHAH00287569

TESTS CONDUCTED

### 3 (I) Test Result Summary:

m	Result (ppm)
Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) 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

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NUMBER: SHAH00287569

TEST REPORT

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

#### (II) RoHS Requirement:

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

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

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#### TEST REPORT

NUMBER: SHAH00287569

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 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



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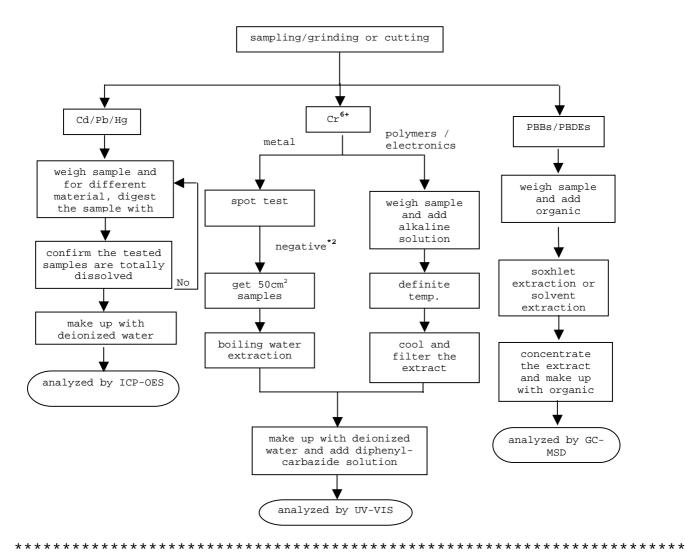
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NUMBER: SHAH00287569

#### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

NUMBER: SHAH00287569

TESTS CONDUCTED

#### **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	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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TESTS CONDUCTED

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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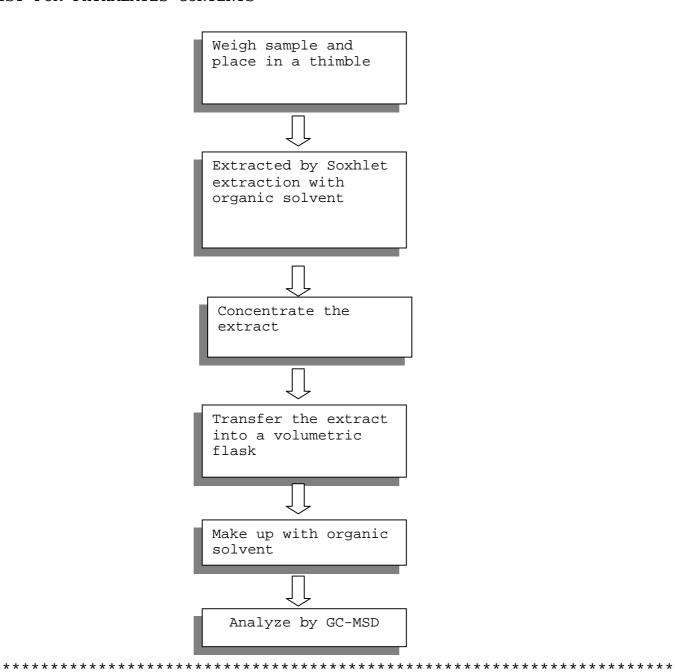
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NUMBER: SHAH00287569

#### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT

NUMBER: SHAH00287569

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)	
HBCDD (HEXABROMOCYCLODODECANE)	ND	

### **REMARKS:**

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011



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TEST REPORT

NUMBER: SHAH00287569

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

\*



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### TEST REPORT



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TEST REPORT

NUMBER: SHAH00287564

DATE: OCT 31, 2011

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be Yellow ink.

Part Description : Ink - yellow.

Part Number : 425903.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

my

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

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LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT



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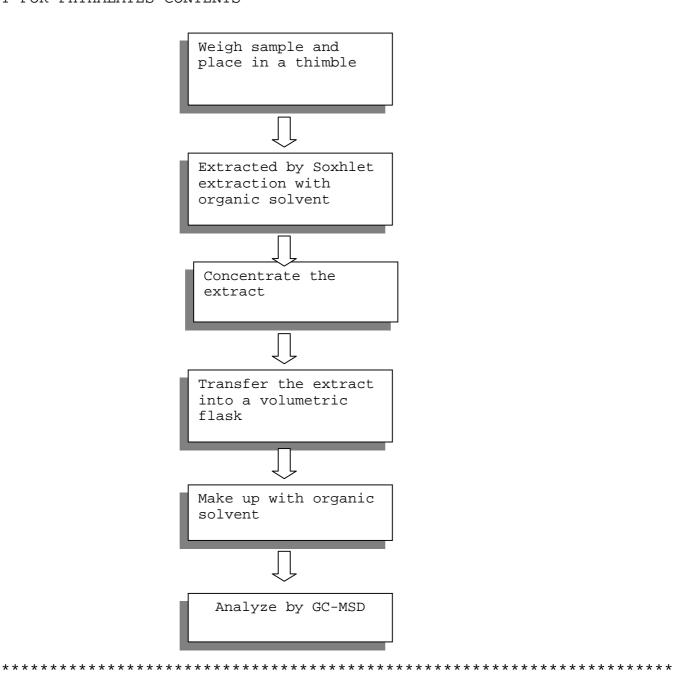
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#### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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#### TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	5350
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

#### (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



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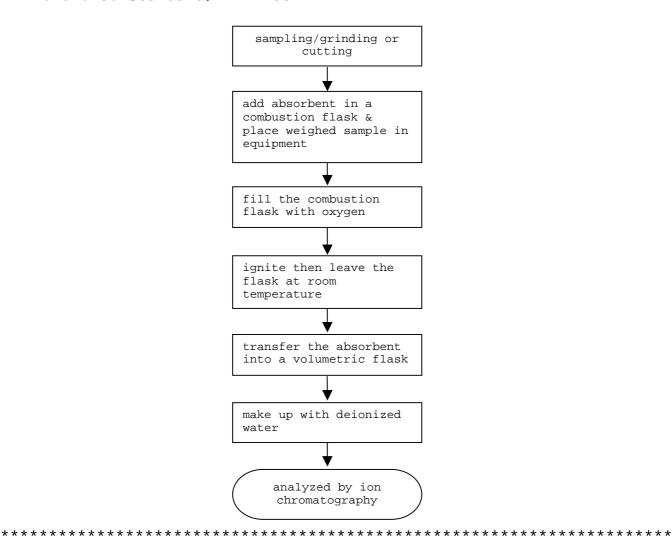
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#### TEST REPORT

TESTS CONDUCTED

#### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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### TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

### 3 (I) Test Result Summary :

<u>-</u>	
Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) 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

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TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

### (II) RoHS Requirement:

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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#### TEST REPORT

NUMBER: SHAH00287564

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 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



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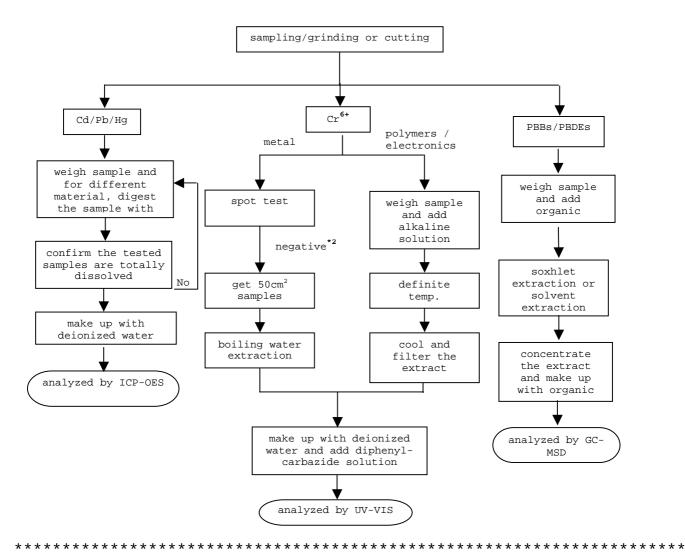
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NUMBER: SHAH00287564

#### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

NUMBER: SHAH00287564

TESTS CONDUCTED

#### **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	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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TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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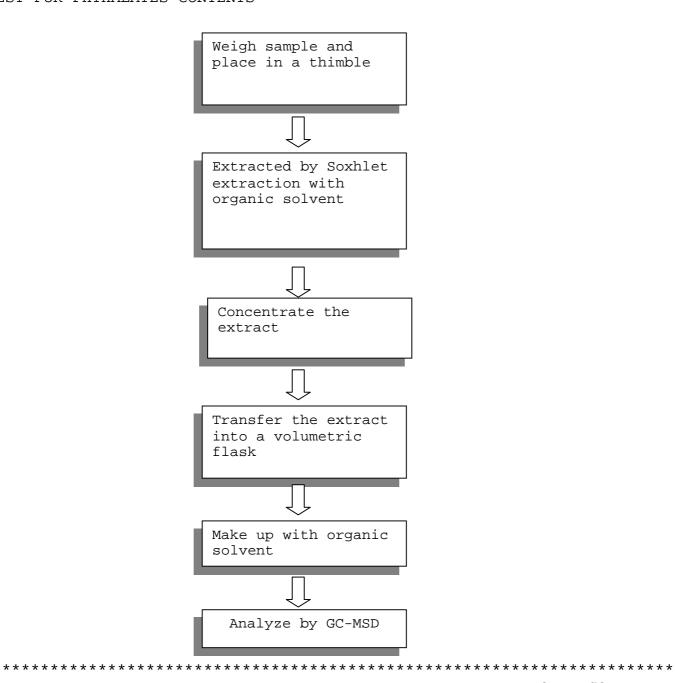
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NUMBER: SHAH00287564

#### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287564

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

### **REMARKS:**

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

(B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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NUMBER: SHAH00287564

### TEST REPORT

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

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TEST REPORT

NUMBER: SHAH00287564

TESTS CONDUCTED



END OF REPORT



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TEST REPORT

NUMBER: SHAH00287549

APPLICANT: LITTELFUSE, INC.

2111

DATE: OCT 31, 2011

800 E. NORTHWEST HWY

SAMPLE DESCRIPTION:

One (1) submitted sample said to be: Blue ink.

ATTN: A. CESISTA/ K. BACILA

Part Description : Ink - blue.
Part Number : 425904.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

myr

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

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STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287549

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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



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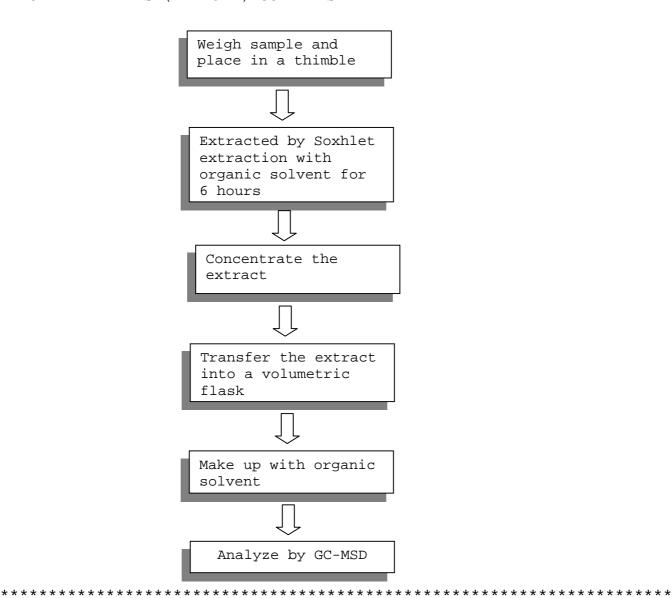
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### TEST REPORT

TESTS CONDUCTED MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES (EN14372) CONTENTS





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TEST REPORT NUMBER: SHAH00287549

TESTS CONDUCTED

### 2 ( I ) Test Result Summary :

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	500
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

Date Sample Received : OCT.25, 2011 Testing Period : OCT.28, 2011

#### (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



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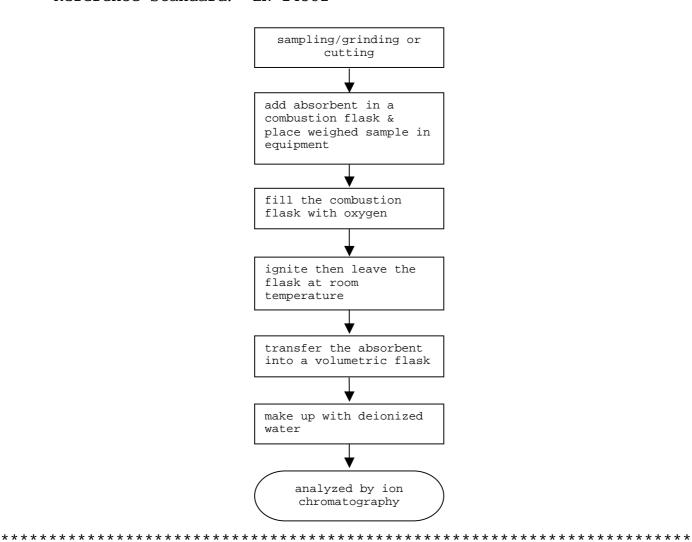
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#### TEST REPORT

TESTS CONDUCTED

(III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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### TEST REPORT NUMBER: SHAH00287549

TESTS CONDUCTED

3 ( I ) Test Result Summary :

5 (1) Test Result Summary .	
Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) 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

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TEST REPORT NUMBER: SHAH00287549

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

Date Sample Received : OCT.28, 2011 Testing Period : OCT.28, 2011

## ( II ) RoHS Requirement:

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

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

\*



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### TEST REPORT

NUMBER: SHAH00287549

#### 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 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



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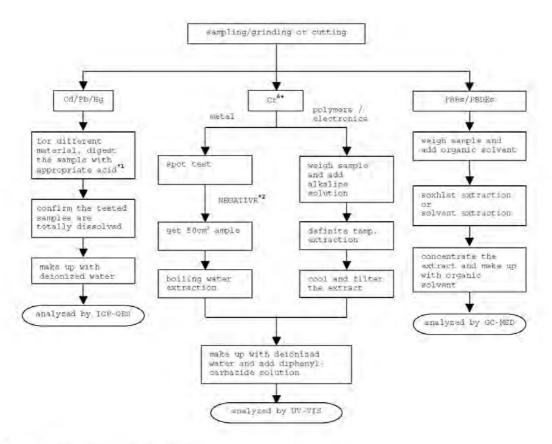
#### TEST REPORT

NUMBER: SHAH00287549

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, HCl, HF, H2O, H3BO3	
Metals	HNO, HC1, HF	
Electronics	HNO <sub>5</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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TESTS CONDUCTED

### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (	(%, w/w)	LIMIT (%, w/w)
			(MAX.)
DIBUTYL PHTHALATE (DBP)	N	D	0.1
DI(2-ETHYL HEXYL) PHTHALATE (DEHP)	N	D	0.1
BENZYL BUTYL PHTHALATE (BBP)	N	D	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

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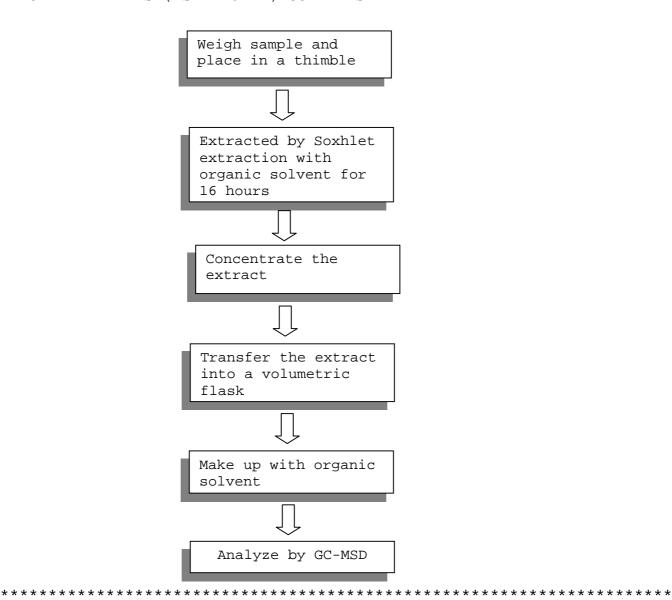
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NUMBER: SHAH00287549

### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES (ASTM D3421) CONTENTS





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TEST REPORT NUMBER: SHAH00287549

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

#### REMARKS:

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011



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NUMBER: SHAH00287549

### TEST REPORT

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD



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NUMBER: SHAH00287549

TESTS CONDUCTED



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TEST REPORT

NUMBER: SHAH00287516

APPLICANT: LITTELFUSE, INC.

DATE: OCT 31, 2011

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be Brown ink.

Part Description : Ink - brown.

Part Number : 425906.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

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MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

FOR INTERTEK TESTING SERVICES

LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED

### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT

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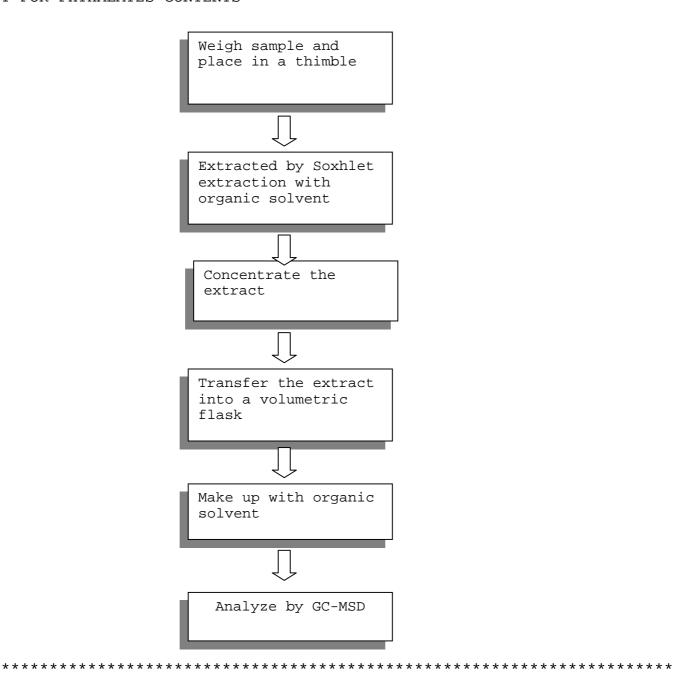
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NUMBER: SHAH00287516

### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	6850
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

### (II) Test Method:

Testing Item	sting Item Testing Method	
Halogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm



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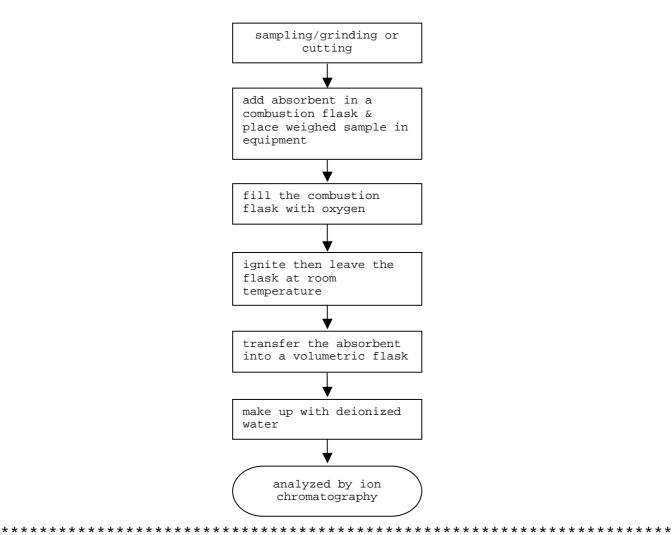
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### TEST REPORT

TESTS CONDUCTED

### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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### TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED

## 3 (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 <sup>6+</sup> ) 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	

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TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

### (II) RoHS Requirement:

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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### TEST REPORT

NUMBER: SHAH00287516

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 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



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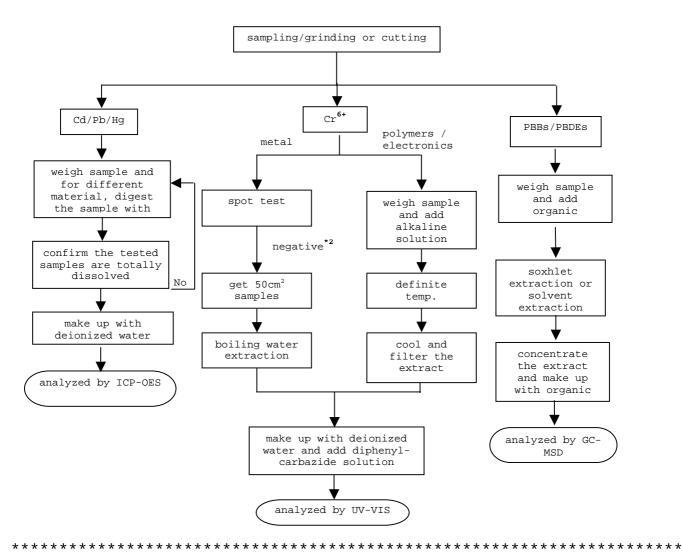
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### TEST REPORT

NUMBER: SHAH00287516

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

NUMBER: SHAH00287516

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.

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TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED

### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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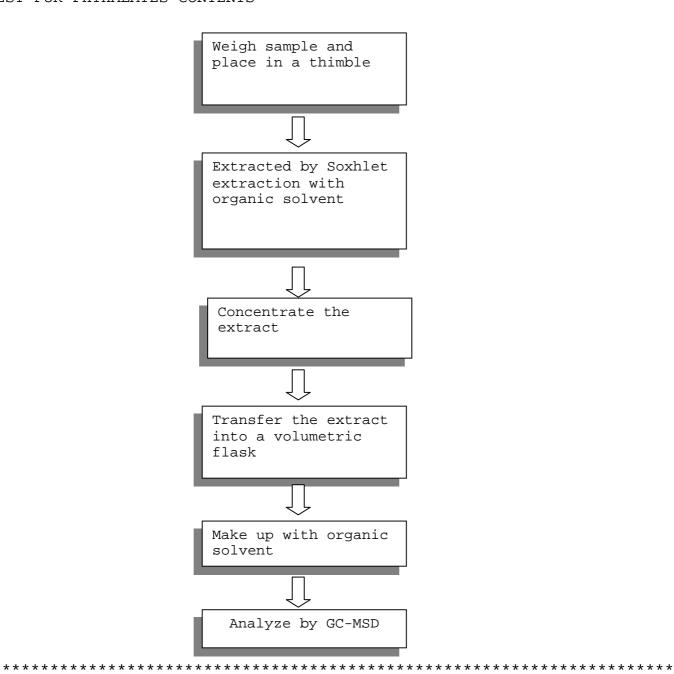
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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NUMBER: SHAH00287516

TEST REPORT

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

### **REMARKS:**

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011

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NUMBER: SHAH00287516

### TEST REPORT

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

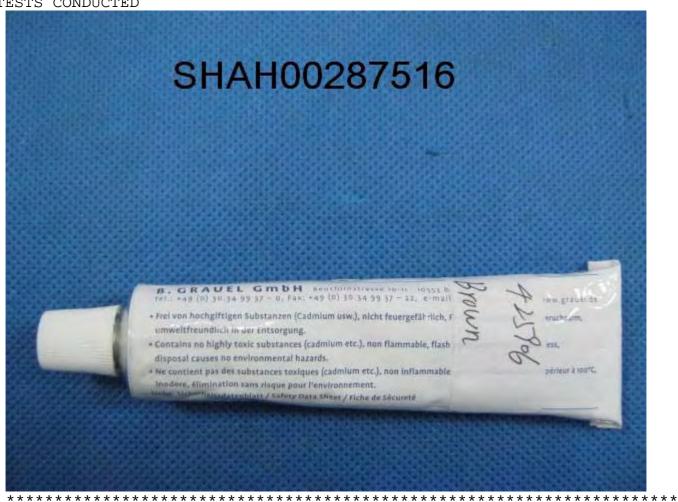


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TEST REPORT NUMBER: SHAH00287516

TESTS CONDUCTED



END OF REPORT



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TEST REPORT

NUMBER: SHAH00287571

DATE: NOV 01, 2011

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be Green ink.

Part Description : Ink - green.

Part Number : 425907.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

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YVVY

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

FOR INTERTEK TESTING SERVICES

LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287571

TESTS CONDUCTED

### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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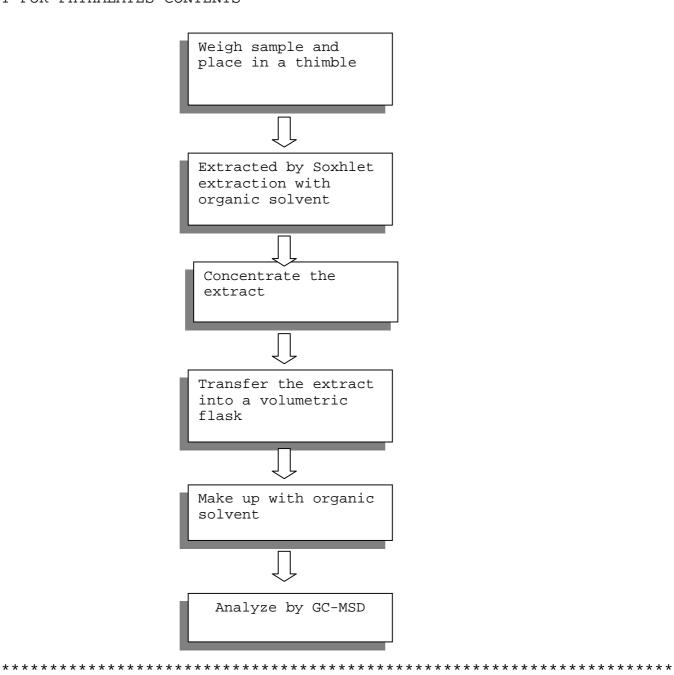
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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### TEST REPORT

NUMBER: SHAH00287571

TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	400
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

### (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



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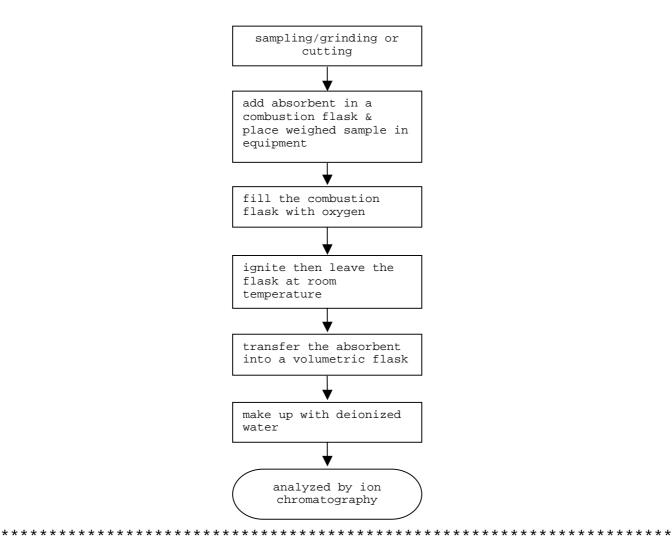
NUMBER: SHAH00287571

### TEST REPORT

TESTS CONDUCTED

### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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### TEST REPORT NUMBER: SHAH00287571

TESTS CONDUCTED

### 3 (I) Test Result Summary :

<u> </u>	
Testing Item	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) 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



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TEST REPORT NUMBER: SHAH00287571

TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

### (II) RoHS Requirement:

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

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

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### TEST REPORT

NUMBER: SHAH00287571

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 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



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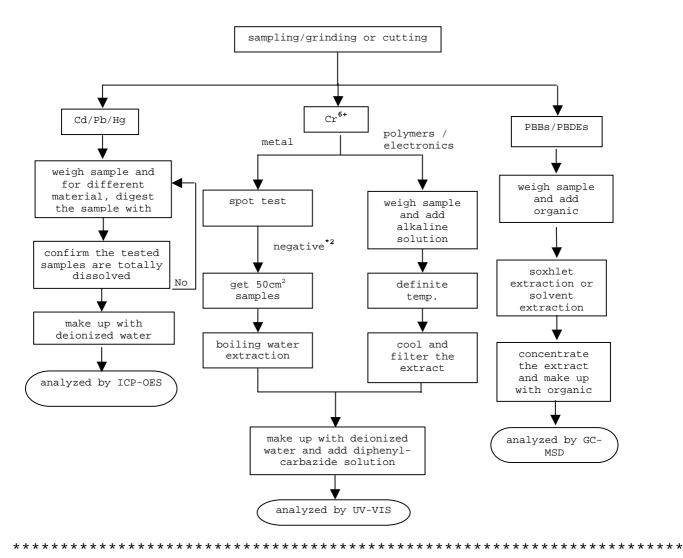
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NUMBER: SHAH00287571

### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

NUMBER: SHAH00287571

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.

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TEST REPORT NUMBER: SHAH00287571

TESTS CONDUCTED

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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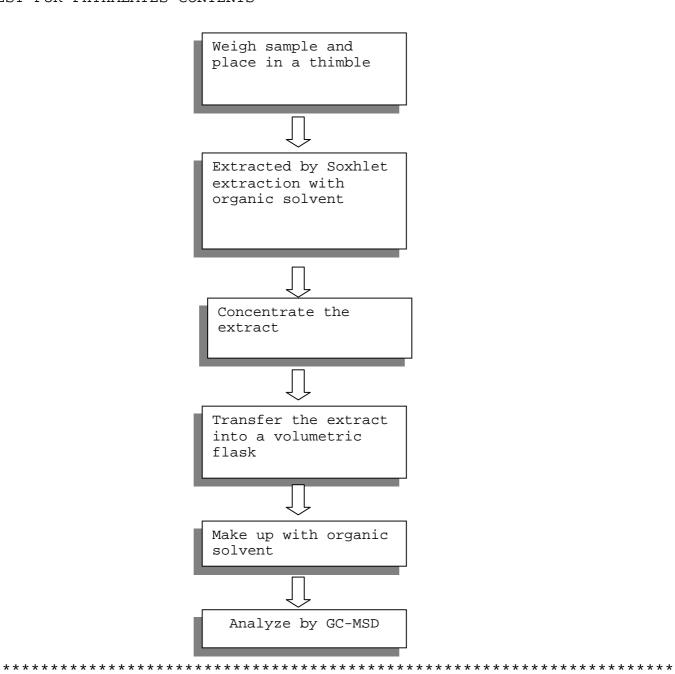
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NUMBER: SHAH00287571

### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287571

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

### **REMARKS:**

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

	TESTING ITEM	EM TESTING METHOD	REPORTING
TESTING TIEM		TESTING METHOD	<u>LIMIT</u>
		WITH REFERENCE TO USEPA	
HBCDD (HEXABROMOCYCLODODECANE)	3540C, BY SOLVENT	10	
	EXTRACTION AND DETERMINED	10 ppm	
		BY GC/MS	

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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### TEST REPORT

NUMBER: SHAH00287571

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble IJ Soxhlet extraction with organic solvent Concentrate the extract IJ Transfer the extract into a volumetric flask IJ Make up with organic solvent Ŋ Analyze by GC-MSD

\*



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NUMBER: SHAH00287571

TEST REPORT

TESTS CONDUCTED



END OF REPORT



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TEST REPORT

NUMBER: SHAH00287556

DATE: OCT 31, 2011

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

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

Part Description : Ink - grey.
Part Number : 425909.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY: FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

YV VY

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

FOR INTERTEK TESTING SERVICES

LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287556

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT



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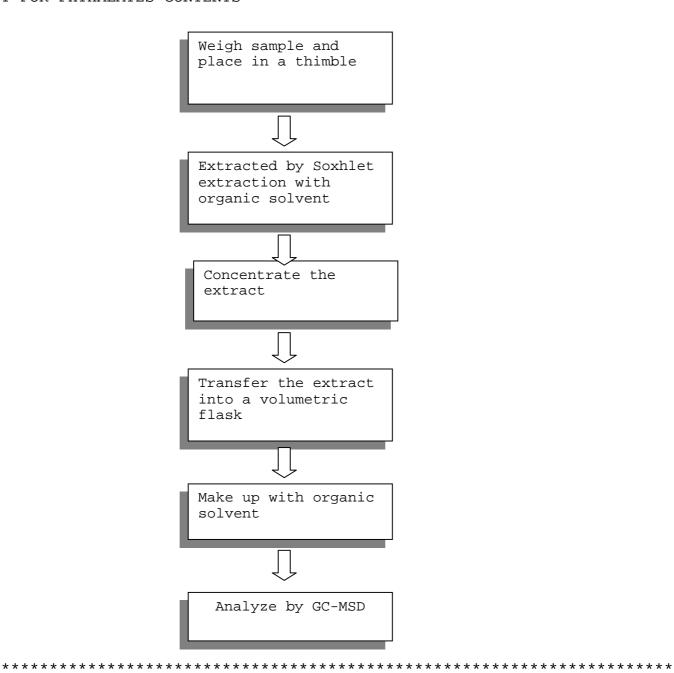
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

### (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



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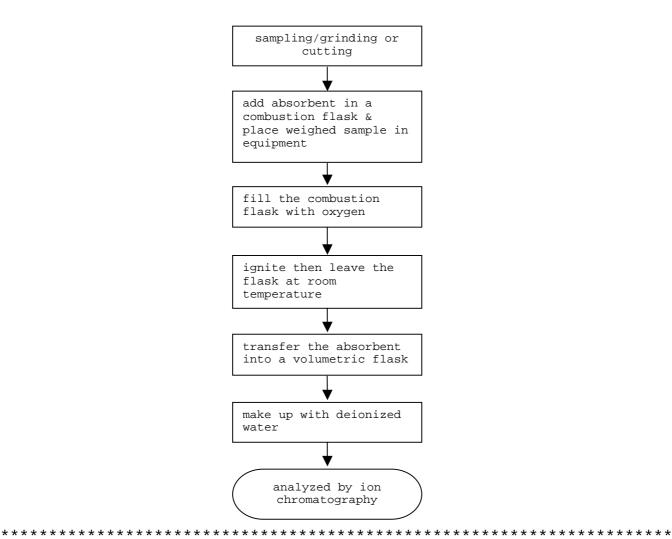
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### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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### TEST REPORT NUMBER: SHAH00287556

TESTS CONDUCTED

### 3 (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 <sup>6+</sup> ) 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	

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TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

### (II) RoHS Requirement:

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

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

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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NUMBER: SHAH00287556

### TEST REPORT

TESTS CONDUCTED

(III) Test Method:

III) Test Method:		
Testing Item	<u>Testing Method</u>	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



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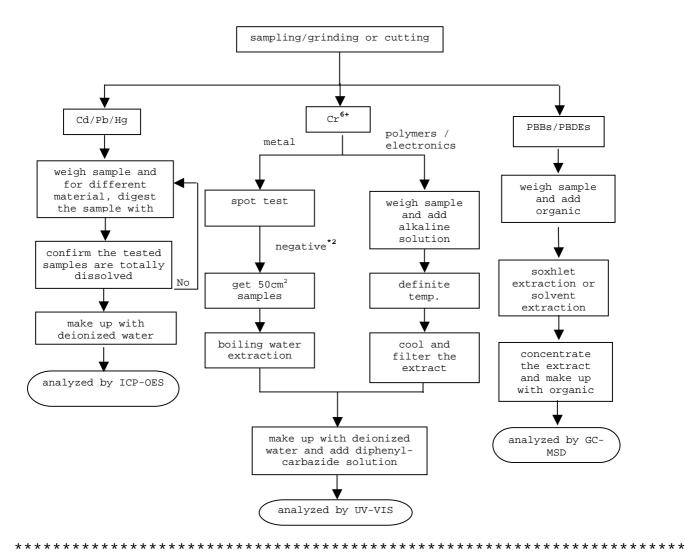
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### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

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TESTS CONDUCTED

#### **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	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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TESTS CONDUCTED

### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE/COMPONENT.

\*



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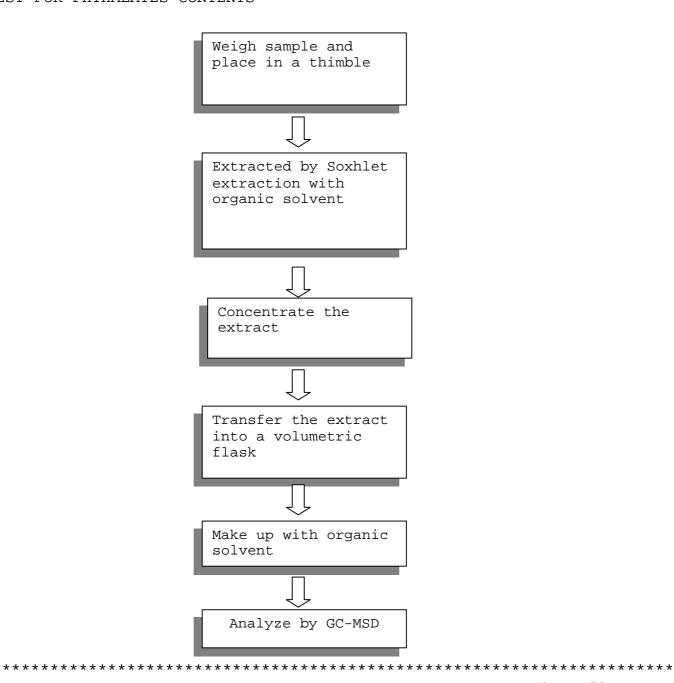
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT

NUMBER: SHAH00287556

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

#### **REMARKS:**

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.28, 2011

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



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### TEST REPORT

TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

\*



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END OF REPORT



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TEST REPORT

NUMBER: SHAH00287560

APPLICANT: LITTELFUSE, INC.

DATE: NOV 01, 2011

800 E. NORTHWEST HWY

ATTN: A. CESISTA/ K. BACILA

SAMPLE DESCRIPTION:

One (1) submitted sample said to be Pale blue ink.

Part Description : Ink - pale blue.

Part Number : 425913.

Date Sample Received : Oct.25, 2011.

Date Test Started : Oct.25, 2011.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

PREPARED AND CHECKED BY:
FOR INTERTEK TESTING SERVICES
LTD., SHANGHAI

myr

MYRA LV CHEMICAL LAB SENIOR MANAGER AUTHORIZED BY:

FOR INTERTEK TESTING SERVICES

LTD., SHANGHAI

STEPHEN TSANG GENERAL MANAGER



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TEST REPORT NUMBER: SHAH00287560

TESTS CONDUCTED

#### 1 PHTHALATE CONTENT TEST

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

TESTED COMPOUND	RESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
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 & AMENDENT 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE

\*



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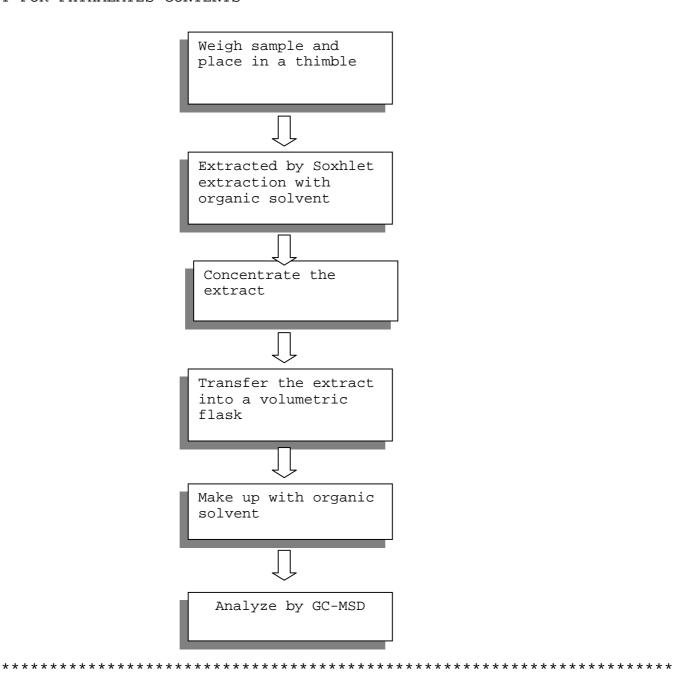
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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### TEST REPORT

NUMBER: SHAH00287560

TESTS CONDUCTED

### 2 (I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	·
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample =

mg/kg

ND = Not detected

Responsibility Of Chemist : Ken He

### (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



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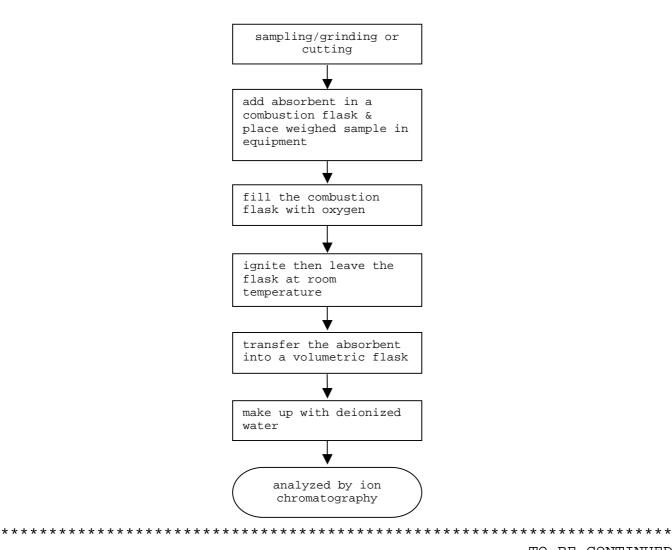
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TEST REPORT

TESTS CONDUCTED

#### (III) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





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TEST REPORT NUMBER: SHAH00287560

TESTS CONDUCTED

### 3 (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 <sup>6+</sup> ) 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

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TESTS CONDUCTED

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Dent Fang / Ken He

### (II) RoHS Requirement:

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

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

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### TEST REPORT

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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 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



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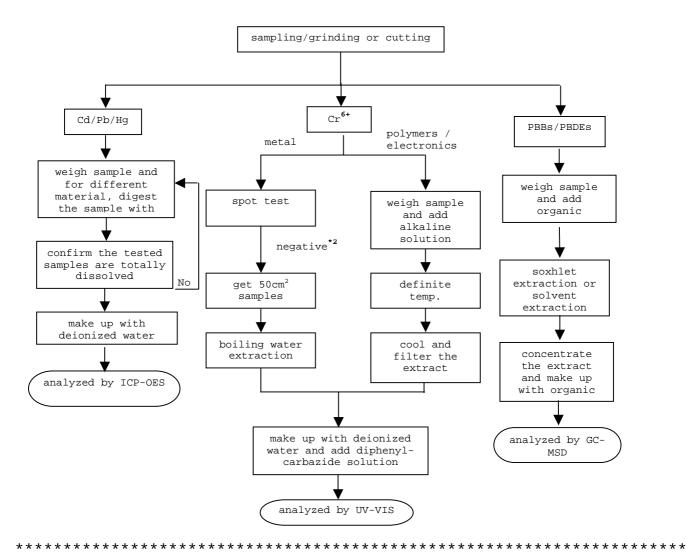
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NUMBER: SHAH00287560

### TEST REPORT

TESTS CONDUCTED (IV) Measurement Flowchart:

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





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TEST REPORT

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TESTS CONDUCTED

#### **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	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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TESTS CONDUCTED

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO ASTM D3421, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

	RESULT (%, w/w)	LIMIT (%, w/w)
		(MAX.)
DIBUTYL 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

% = PERCENTAGE BASED ON DRY WEIGHT OF SAMPLE

\*



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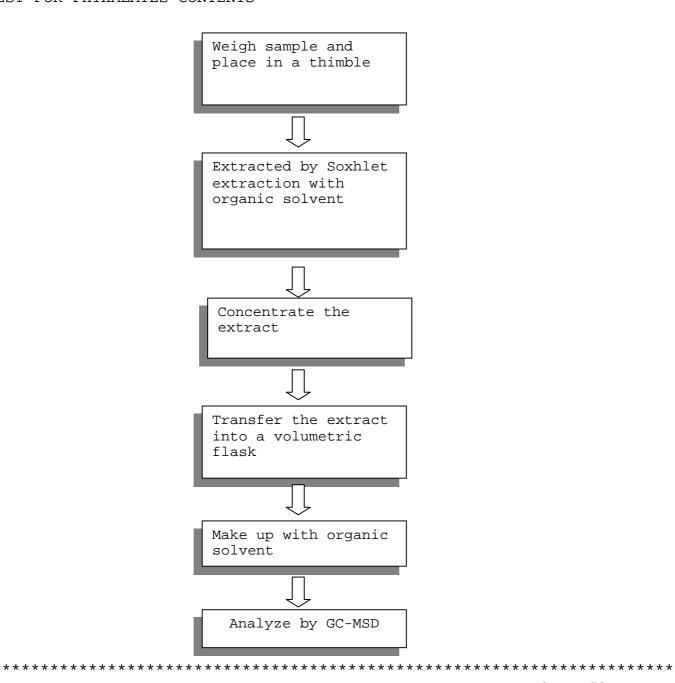
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### TEST REPORT

TESTS CONDUCTED
MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS





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TEST REPORT NUMBER: SHAH00287560

TESTS CONDUCTED

5 (A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT(ppm)
HBCDD (HEXABROMOCYCLODODECANE)	ND

### REMARKS:

ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

#### (B) TEST METHOD:

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

DATE SAMPLE RECEIVED : OCT.25, 2011

TESTING PERIOD : OCT.25, 2011 TO OCT.31, 2011



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TEST REPORT

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TESTS CONDUCTED

MEASUREMENT FLOWCHART:

TEST FOR HBCDD (Hexabromocyclododecane) CONTENT

Weigh sample and place into a thimble

Soxhlet extraction with organic solvent

Concentrate the extract

Transfer the extract into a volumetric flask

Make up with organic solvent

Analyze by GC-MSD

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TEST REPORT

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TESTS CONDUCTED



END OF REPORT