



## ICP Test Report Certification Packet

Company Name: Littelfuse, Inc.

Product Type: Surface Mount Varistors

Product Series: CH Series RoHS Compliant Models

Issue Date: May 18, 2011

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes.

And it is certified by Littelfuse, Inc. that the series products listed above are compliant with LF Halogen Free Standard ( $Cl \leq 800\text{ppm}$ ,  $Br \leq 800\text{ppm}$ ,  $Cl+Br \leq 1000\text{ppm}$ ).

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

Issued by: *David Huang*

<DGLF Environmental, Health & Safety Engineer >

(1) Parts, sub-materials and unit parts

This document covers CH Series RoHS compliant models manufactured by Littelfuse, Inc.

Please see Table 1 for raw materials used.

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1.

Remarks :

Pb (lead) contained in glass of electronic components and is categorized as exempt under section 5 of the RoHS Annex.



Table 1: List of Raw Materials covered by this report

Total Parts	P/N	Raw Material Description	Page
1	N/A	BLACK CHIP CH	3-7
2	N/A	SILVER PASTE SP-A6PL	8-17
3	MS208	TERMINATIONS	18-24
4	MS202	BLUE SILICONE	25-31



**Test Report**

Number: SZHH0058701804

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

Date: May 11, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

**Sample Description:**

One (1) submitted sample said to be **Black Chip CH.**



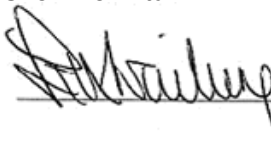

\*\*\*\*\*

**Tests conducted:**

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

\*\*\*\*\*

Authorized by:  
For Intertek Testing Services  
Shenzhen Ltd.

Ben N.L. Lin  
General Manager

# **Test Report**

Number: SZHH0058701804

## Tests Conducted

RoHS Chemical Test

(A) Test Result Summary:

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

Chemist: Wang Haijun/Tang Wenming

mg/kg = milligram per kilogram = ppm

< = Less than

ND = Not detected

\*\*\*\*\*

# Test Report

Number: SZHH0058701804

## Tests Conducted

### (B) RoHS Requirement:

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

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

### (C) Test Method:

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

Date sample received: May 04, 2011

Testing period: May 04, 2011 to May 09, 2011

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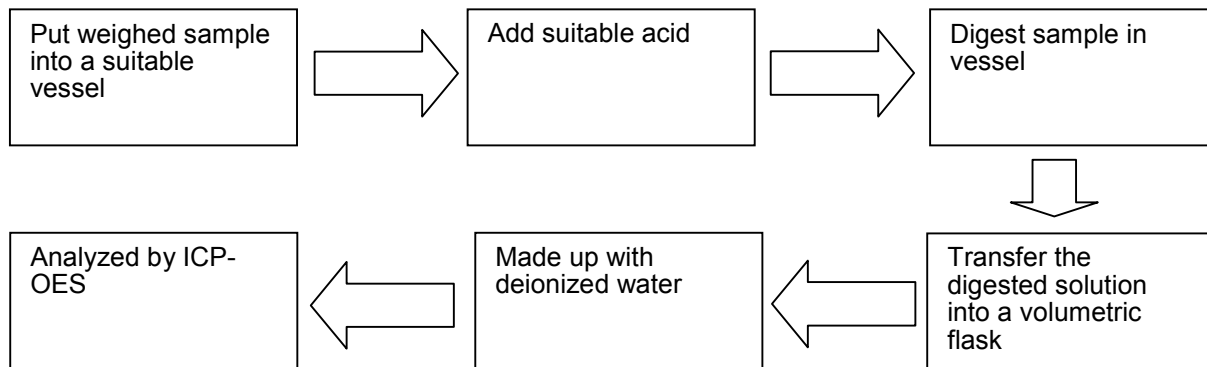
**Test Report**

Number: SZHH0058701804

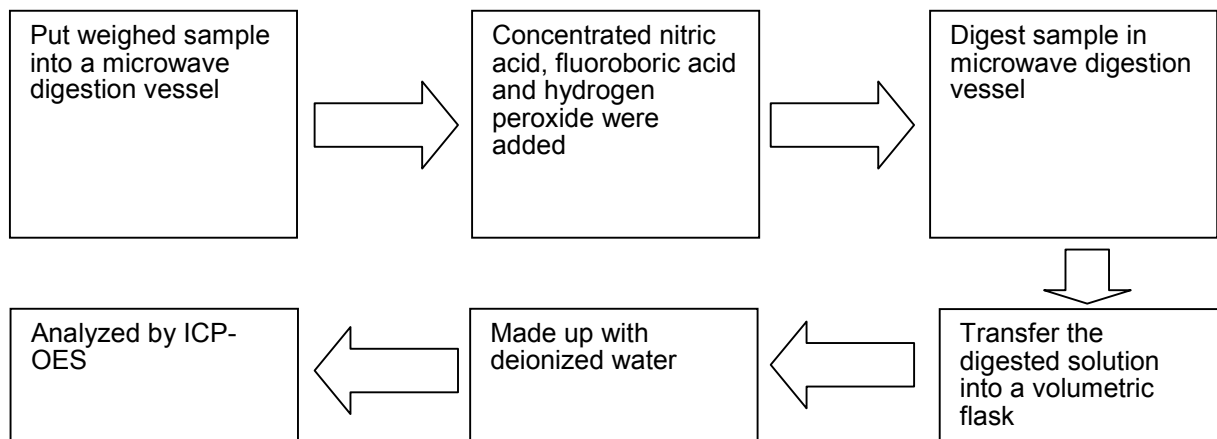
Tests Conducted

(D) Measurement Flowchart:

1. Test for Cd/Pb Contents



2. Test for Hg Content



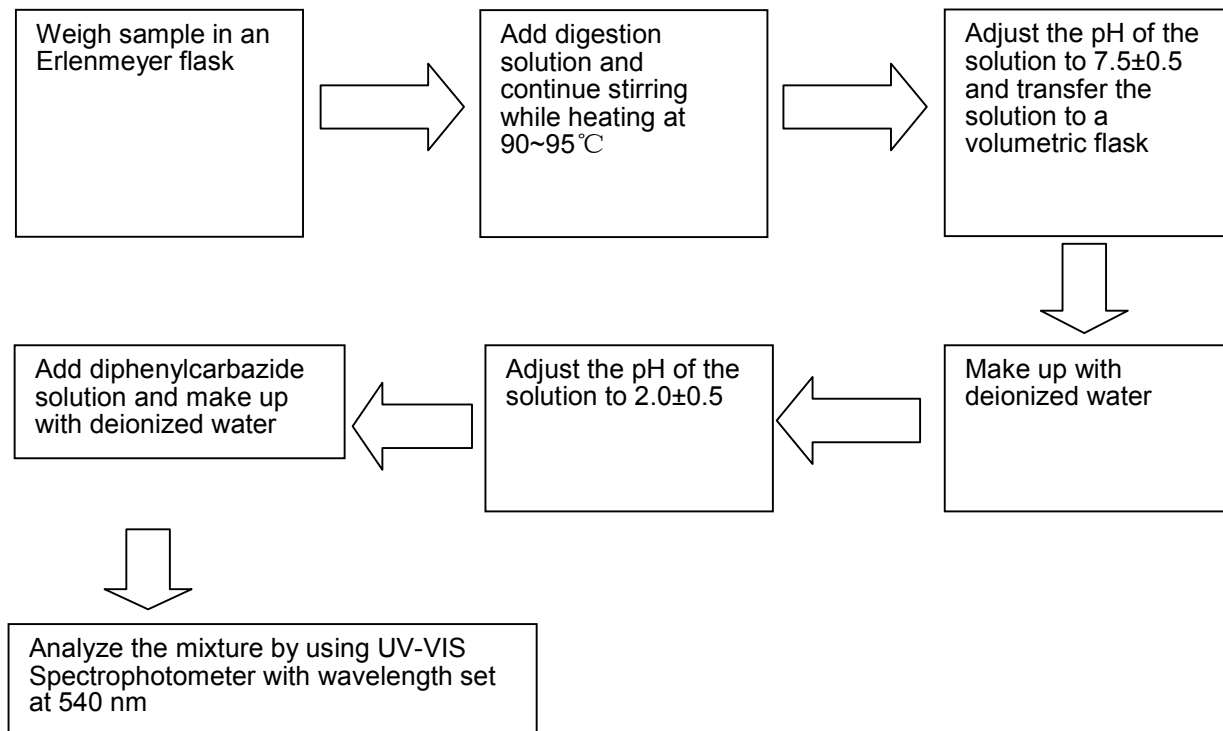
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## Test Report

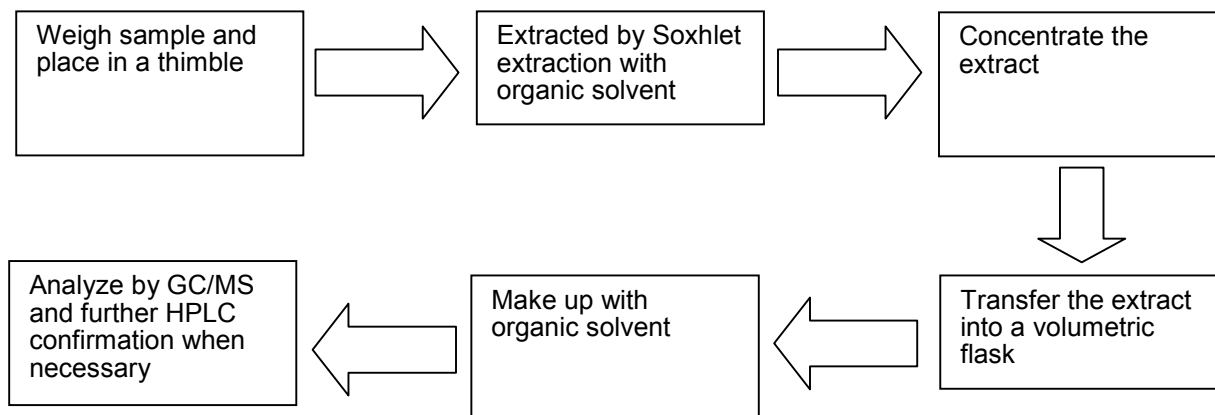
Number: SZHH0058701804

### Tests Conducted

#### 3. Test for Chromium (VI) ( $\text{Cr}^{6+}$ ) Content (Alkaline Digestion)



#### 4. Test for PBBs/PBDEs Contents



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End of report

# 測試報告

## Test Report

號碼(No.) : CE/2011/21056 日期(Date) : 2011/02/17 頁數(Page) : 1 of 10

新日本化金株式會社

SHIN-NIHON KAKIN CO., LTD.

東京都板橋區宮本町33番7號

33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



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

樣品名稱(Sample Description) : 銀膏 (SILVER PASTE)  
樣品型號(Style/Item No.) : SP-A6PL  
材料批號(Lot No.) : 01207  
收件日期(Sample Receiving Date) : 2011/2/10  
測試期間(Testing Period) : 2011/2/10 TO 2011/02/17

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

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

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# 測試報告

## Test Report

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SHIN-NIHON KAKIN CO., LTD.

東京都板橋區宮本町33番7號

33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



### 測試結果(Test Results)

測試部位(PART NAME)No.1 : 墨綠色膏狀 (BLACKISH GREEN PASTE)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
汞 / 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.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	參考IEC 62321: 2008方法, 以UV-VIS檢測. / With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
六溴環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 025637-99-4)	mg/kg	參考US EPA 3540C方法, 以氣相層析/質譜儀檢測. / With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.

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# 測試報告

## Test Report

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SHIN-NIHON KAKIN CO., LTD.

東京都板橋區宮本町33番7號

33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
鄰苯二甲酸甲苯基丁酯 / BBP (Benzyl butyl phthalate) (CAS No.: 000085-68-7)	%	參考EN 14372, 以氣相層析儀/質譜儀檢測 之。 / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 000084-74-2)	%	參考EN 14372, 以氣相層析儀/質譜儀檢測 之。 / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	0.034
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 000117-81-7)	%	參考EN 14372, 以氣相層析儀/質譜儀檢測 之。 / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
四溴雙酚-A / Tetrabromobisphenol A (TBBP-A) (CAS No.: 000079-94-7)	mg/kg	參考DIN 53313方法, 以氣相層析儀/質譜儀 檢測。 / With reference to DIN 53313 method. Analysis was performed by	10	n.d.
鹵素 / Halogen				
鹵素(氟) / Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分 析。 / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
鹵素(氯) / Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)			50	n.d.
鹵素(溴) / Halogen-Bromine (Br) (CAS No.: 010097-32-2)			50	n.d.
鹵素(碘) / Halogen-Iodine (I) (CAS No.: 014362-44-8)			50	n.d.

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## 測試報告

## Test Report

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
				No.1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321: 2008方法, 以氣相層析儀/ 質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl			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.
八溴聯苯 / Octabromobiphenyl			5	n.d.
九溴聯苯 / Nonabromobiphenyl			5	n.d.
十溴聯苯 / Decabromobiphenyl			5	n.d.
多溴聯苯醚總和 / Sum of PBDEs			-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether			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.

## 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)

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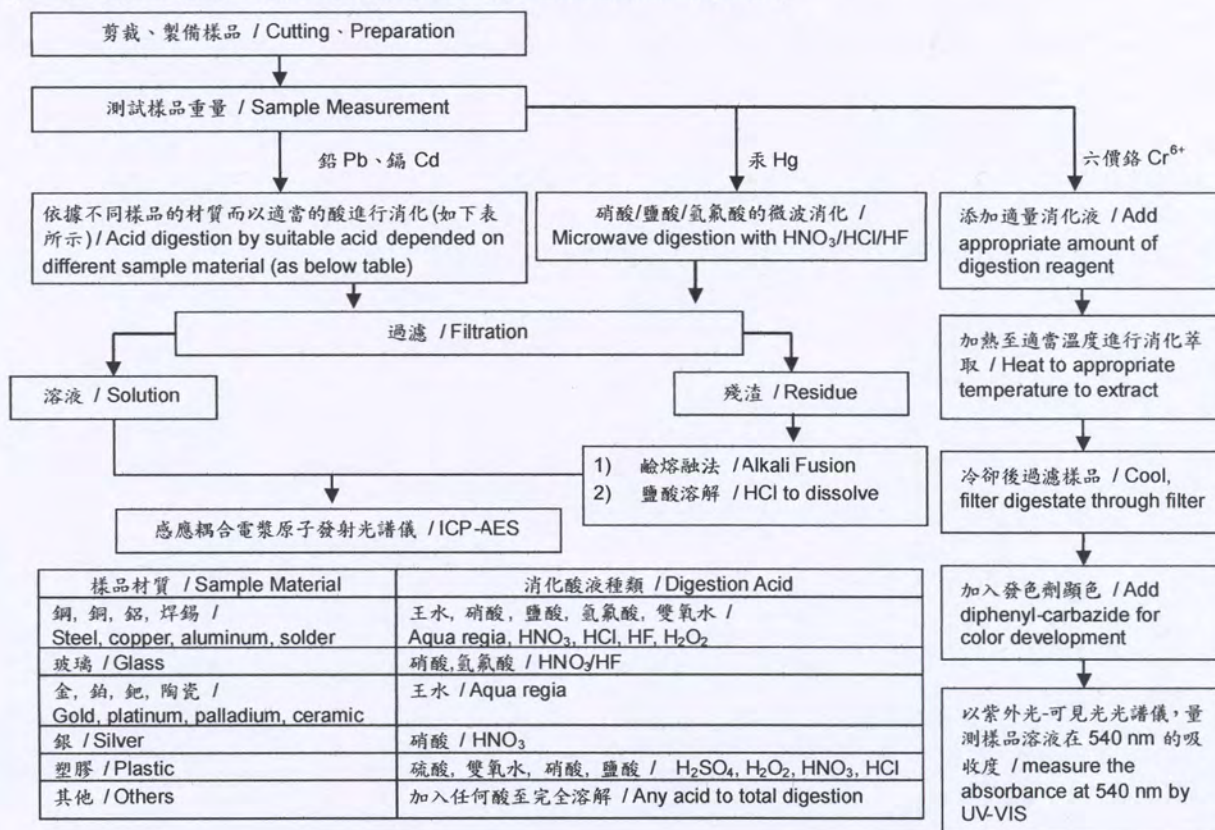
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- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
-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



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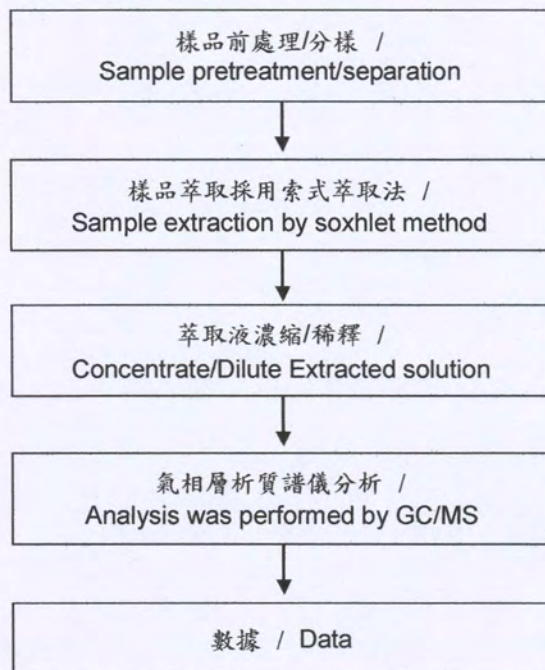
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### 索式萃取(GC/MS)分析流程圖 /

#### Analytical flow chart of Soxhlet extraction (GC/MS) procedure

- 1) 測試人員：傅莉雅 / Name of the person who made measurement: Lydia Fu
  - 2) 測試負責人：陳新智 / Name of the person in charge of measurement: Shinjyh Chen
- 測試項目(Test Items): 可塑劑、苯並三唑類化合物、六溴環十二烷、壬酚、單甲基二  
溴二苯基甲烷、有機磷化合物 / Phthalate、Benzotriazole、HBCDD、NP、DBBT、  
Organic phosphorus compounds



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## 測試報告 Test Report

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新日本化金株式會社

SHIN-NIHON KAKIN CO., LTD.

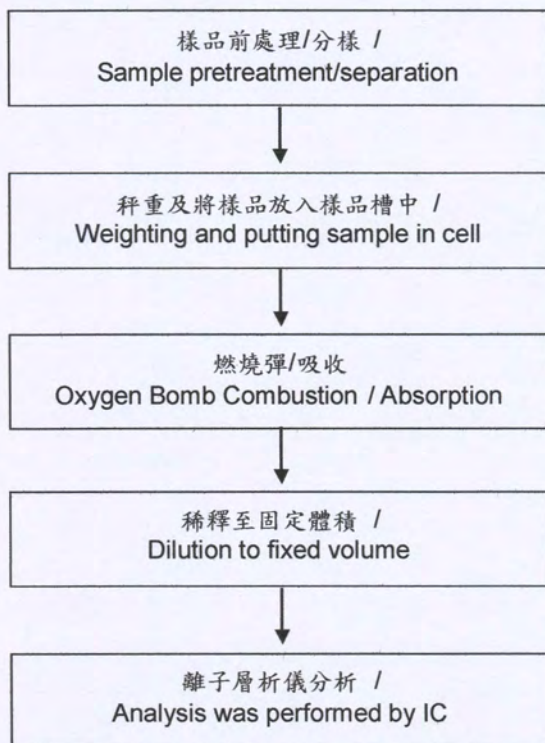
東京都板橋區宮本町33番7號

33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



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

- 1) 測試人員：陳思臻 / Name of the person who made measurement: Rita Chen
- 2) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



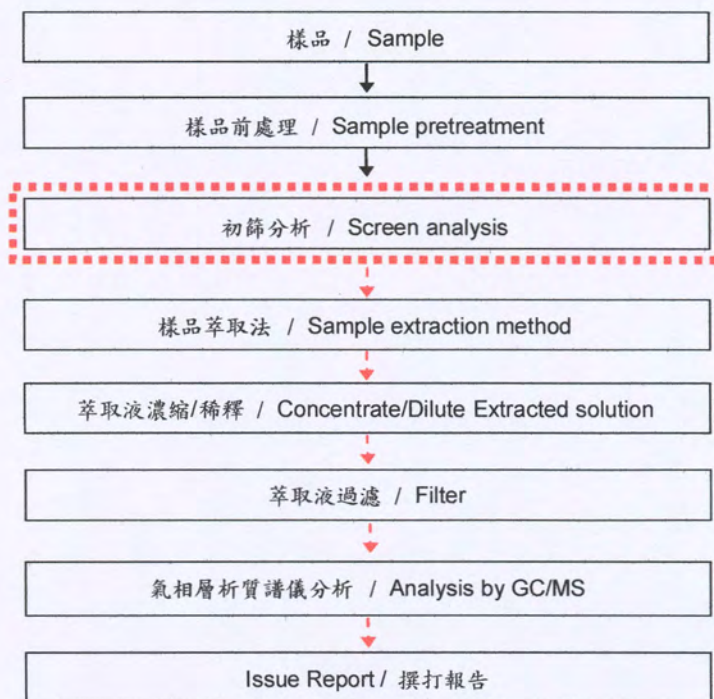
### 分析流程圖 / Analytical flow chart

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

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

■ 測試項目 (Test Items): 多溴聯苯/多溴聯苯醚, 四溴雙酚-A雙 / PBB/PBDE, TBBP-A-bis

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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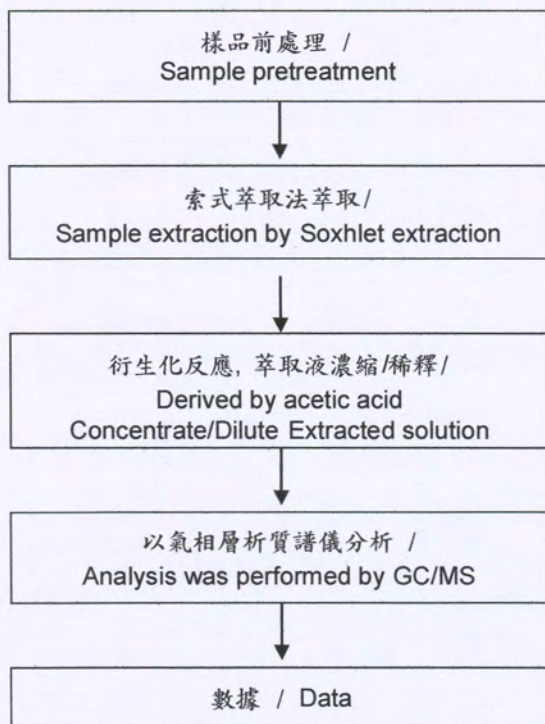
33-7, MIYAMOTO-CHO, ITABASHI-KU, TOKYO, JAPAN



### 分析流程圖 / Analytical flow chart

- 1) 測試人員：傅莉雅 / Name of the person who made measurement: Lydia Fu
- 2) 測試負責人：陳新智 / Name of the person in charge of measurement: Shinjyh Chen

■ 測試項目(Test Items): 四溴雙酚-A、雙酚 A / TBBP-A、Bisphenol A



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### CE/2011/21056



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**Test Report**

Number: SZHH0058701802

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

Date: May 11, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

**Sample Description:**

One (1) submitted sample said to be **Light grey paste (Terminations)**.  
Part No.: MS208.



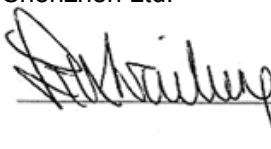

\*\*\*\*\*

**Tests conducted:**

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

\*\*\*\*\*

Authorized by:  
For Intertek Testing Services  
Shenzhen Ltd.

Ben N.L. Lin  
General Manager

# Test Report

Number: SZHH0058701802

## Tests Conducted

### 1 RoHS Chemical Test

#### (A) Test Result Summary:

Testing Item	Result
Cadmium (Cd) Content (mg/kg)	ND(<2)
Lead (Pb) Content (mg/kg)	2270
Mercury (Hg) Content (mg/kg)	ND(<2)
Chromium (VI)(Cr <sup>6+</sup> ) Content (mg/kg)	ND(<1)
Polybrominated Biphenyls (PBBs)(mg/kg)	
Monobromobiphenyl (MonoBB)	ND(<5)
Dibromobiphenyl (DiBB)	ND(<5)
Tribromobiphenyl (TriBB)	ND(<5)
Tetrabromobiphenyl (TetraBB)	ND(<5)
Pentabromobiphenyl (PentaBB)	ND(<5)
Hexabromobiphenyl (HexaBB)	ND(<5)
Heptabromobiphenyl (HeptaBB)	ND(<5)
Octabromobiphenyl (OctaBB)	ND(<5)
Nonabromobiphenyl (NonaBB)	ND(<5)
Decabromobiphenyl (DecaBB)	ND(<5)
Polybrominated Diphenyl Ethers (PBDEs)(mg/kg)	
Monobromodiphenyl Ether (MonoBDE)	ND(<5)
Dibromodiphenyl Ether (DiBDE)	ND(<5)
Tribromodiphenyl Ether (TriBDE)	ND(<5)
Tetrabromodiphenyl Ether (TetraBDE)	ND(<5)
Pentabromodiphenyl Ether (PentaBDE)	ND(<5)
Hexabromodiphenyl Ether (HexaBDE)	ND(<5)
Heptabromodiphenyl Ether (HeptaBDE)	ND(<5)
Octabromodiphenyl Ether (OctaBDE)	ND(<5)
Nonabromodiphenyl Ether (NonaBDE)	ND(<5)
Decabromodiphenyl Ether (DecaBDE)	ND(<5)

Chemist: Wang Haijun/Tang Wenming

mg/kg = milligram per kilogram based on dry weight of sample = ppm

< = Less than

ND = Not detected

\*\*\*\*\*

# Test Report

Number: SZHH0058701802

## Tests Conducted

### (B) RoHS Requirement:

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

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

### (C) Test Method:

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

Date sample received: May 04, 2011

Testing period: May 04, 2011 to May 09, 2011

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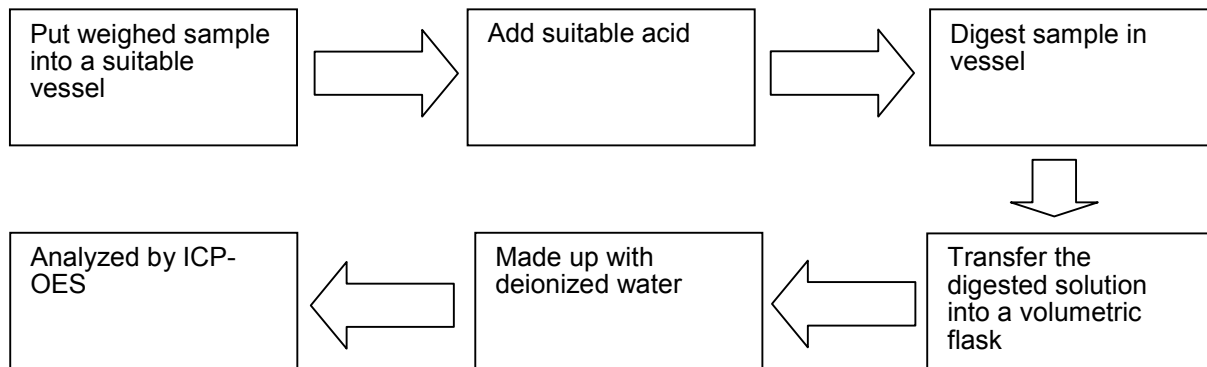
# Test Report

Number: SZHH0058701802

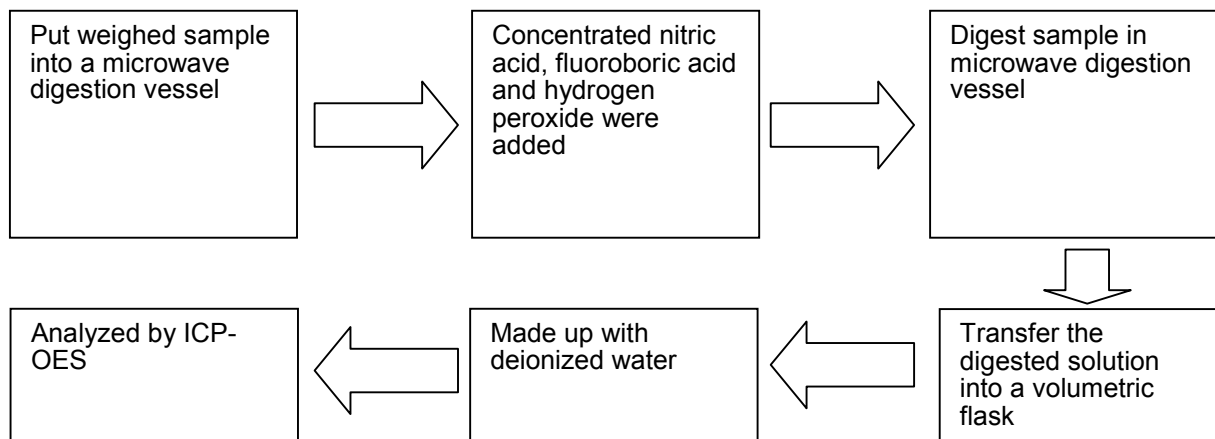
## Tests Conducted

### (D) Measurement Flowchart:

#### 1. Test for Cd/Pb Contents



#### 2. Test for Hg Content



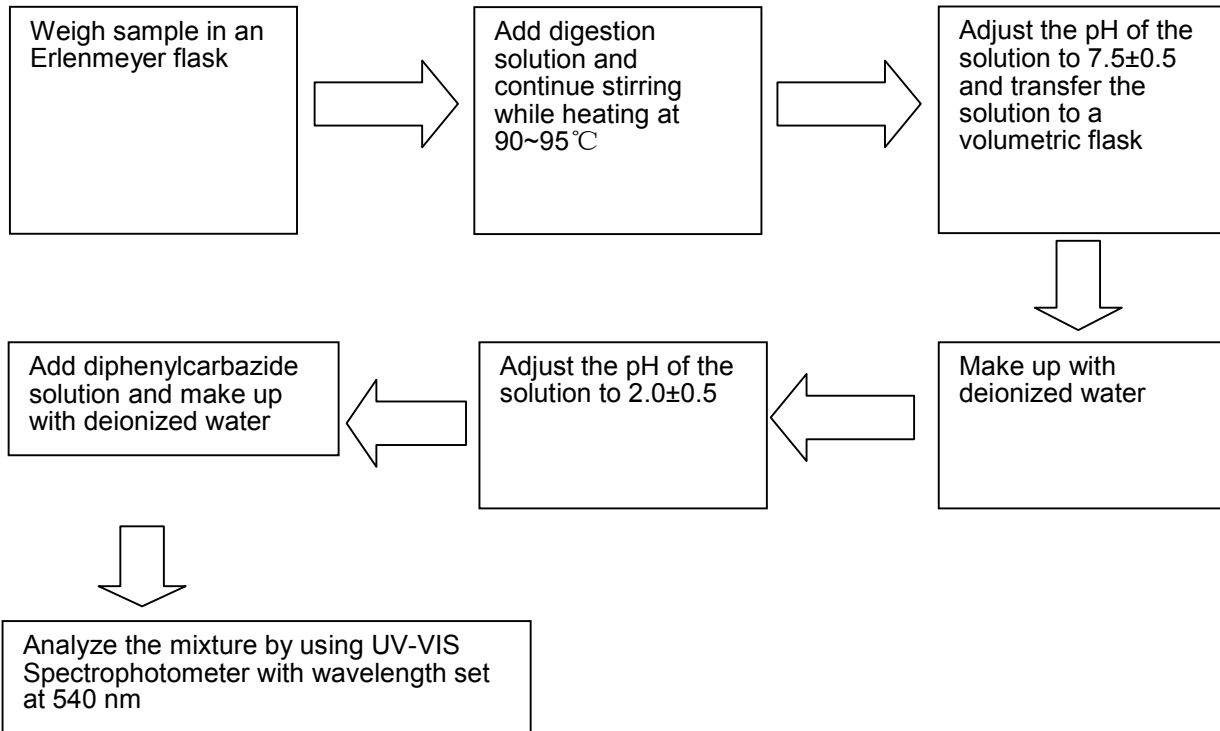
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## Test Report

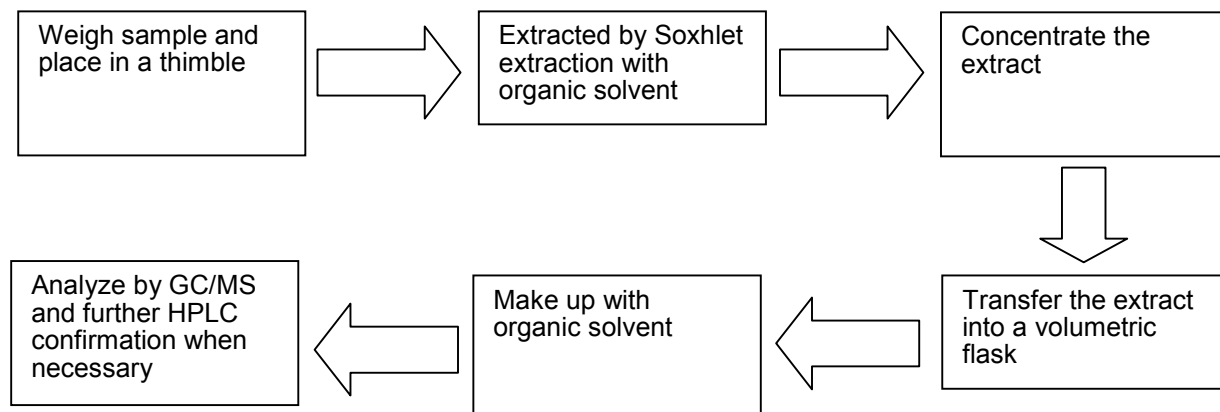
Number: SZHH0058701802

### Tests Conducted

#### 3. Test for Chromium (VI) ( $\text{Cr}^{6+}$ ) Content (Alkaline Digestion)



#### 4. Test for PBBs/PBDEs Contents



\*\*\*\*\*



**Test Report**

Number: SZHH0058701802

## Tests Conducted

2 Halogen Content

## ( I ) Test Result Summary:

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

mg/kg= milligram per kilogram based on dry weight of sample = ppm

ND= Not detected

## ( II ) Test Method:

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

Reporting limit = Quantitation limit of analyte in sample

Date sample received: May 04, 2011

Testing period: May 04, 2011 to May 09, 2011

\*\*\*\*\*

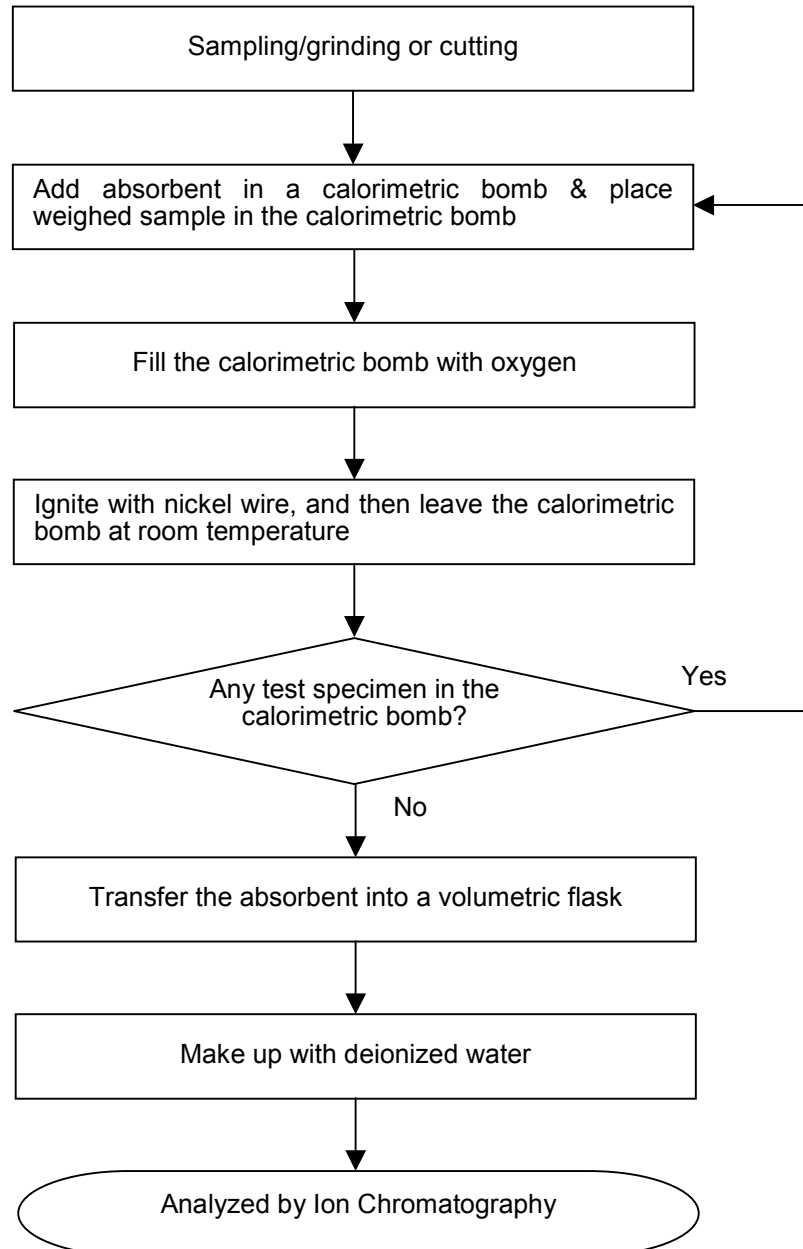
**Test Report**

Number: SZHH0058701802

Tests Conducted

(III) Measurement Flowchart:

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



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



Test Report

Number: SZHH0058701805

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

Date: May 11, 2011

Attn: KRISTEEN BACILA/ARSENIO CESISTA JR.

Sample Description:  
One (1) submitted sample said to be **Blue paste (Blue Silicone)**.  
Part No.: MS202.

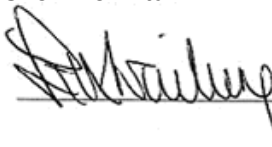



\*\*\*\*\*

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

\*\*\*\*\*

Authorized by:  
For Intertek Testing Services  
Shenzhen Ltd.

Ben N.L. Lin  
General Manager

# Test Report

Number: SZHH0058701805

## Tests Conducted

### 1 RoHS Chemical Test

#### (A) Test Result Summary:

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

Chemist: Wang Haijun/Tang Wenming

mg/kg = milligram per kilogram based on dry weight of sample = ppm

< = Less than

ND = Not detected

\*\*\*\*\*

# Test Report

Number: SZHH0058701805

## Tests Conducted

### (B) RoHS Requirement:

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

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

### (C) Test Method:

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

Date sample received: May 04, 2011

Testing period: May 04, 2011 to May 09, 2011

\*\*\*\*\*

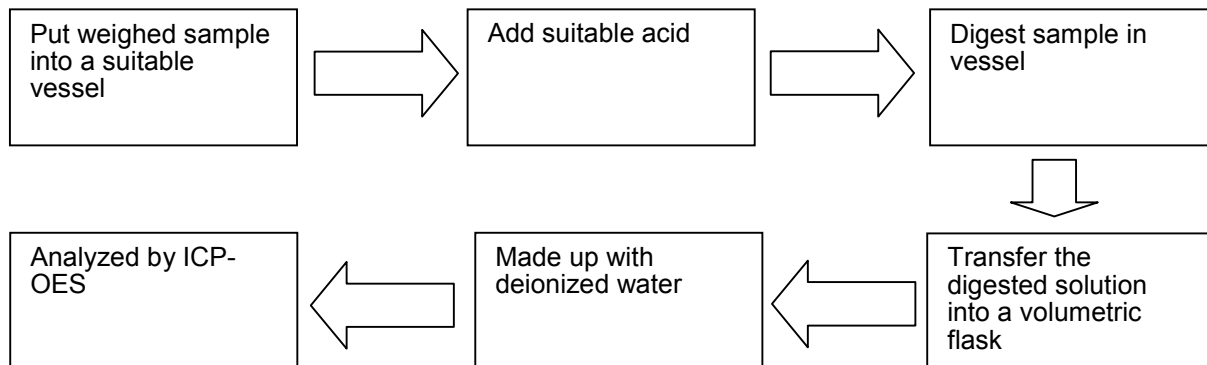
## Test Report

Number: SZHH0058701805

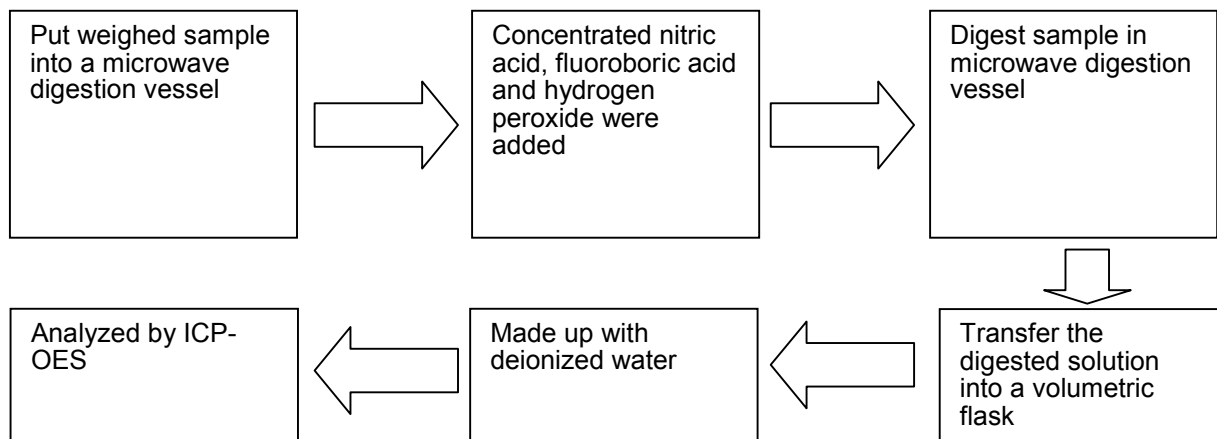
### Tests Conducted

#### (D) Measurement Flowchart:

##### 1. Test for Cd/Pb Contents



##### 2. Test for Hg Content



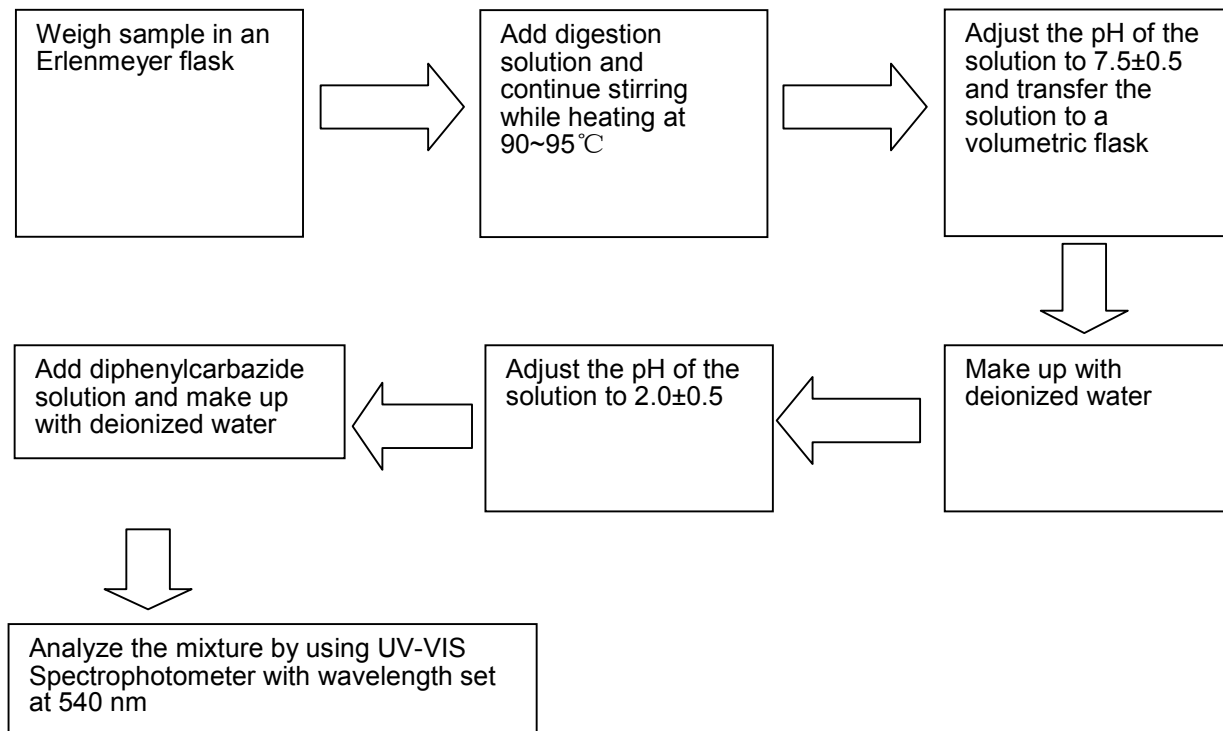
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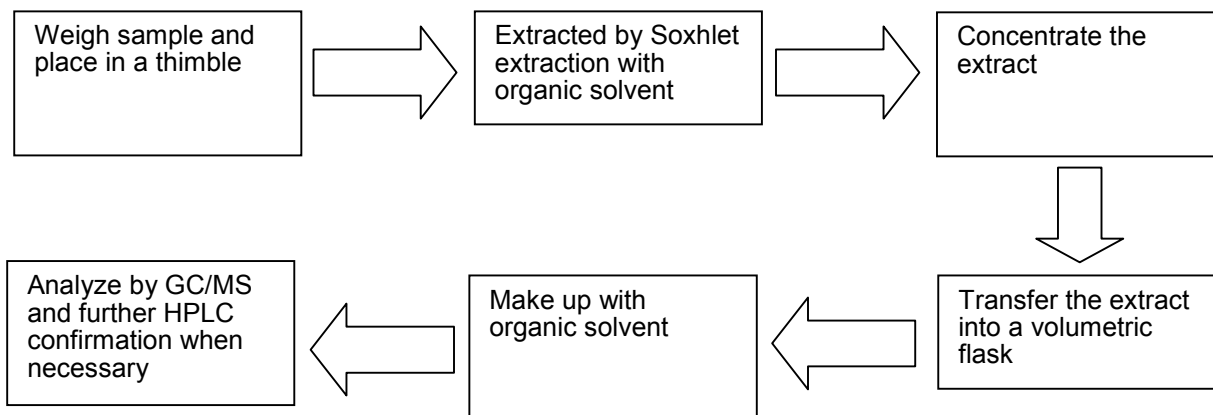
Number: SZHH0058701805

### Tests Conducted

#### 3. Test for Chromium (VI) ( $\text{Cr}^{6+}$ ) Content (Alkaline Digestion)



#### 4. Test for PBBs/PBDEs Contents



\*\*\*\*\*

**Test Report**

Number: SZHH0058701805

## Tests Conducted

2 Halogen Content

## ( I ) Test Result Summary:

<u>Testing Item</u>	<u>Result (mg/kg)</u>
Fluorine (F) Content	ND
Chlorine (Cl) Content	462
Bromine (Br) Content	ND
Iodine (I) Content	ND

mg/kg= milligram per kilogram based on dry weight of sample = ppm

ND= Not detected

## ( II ) Test Method:

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

Reporting limit = Quantitation limit of analyte in sample

Date sample received: May 04, 2011

Testing period: May 04, 2011 to May 09, 2011

\*\*\*\*\*

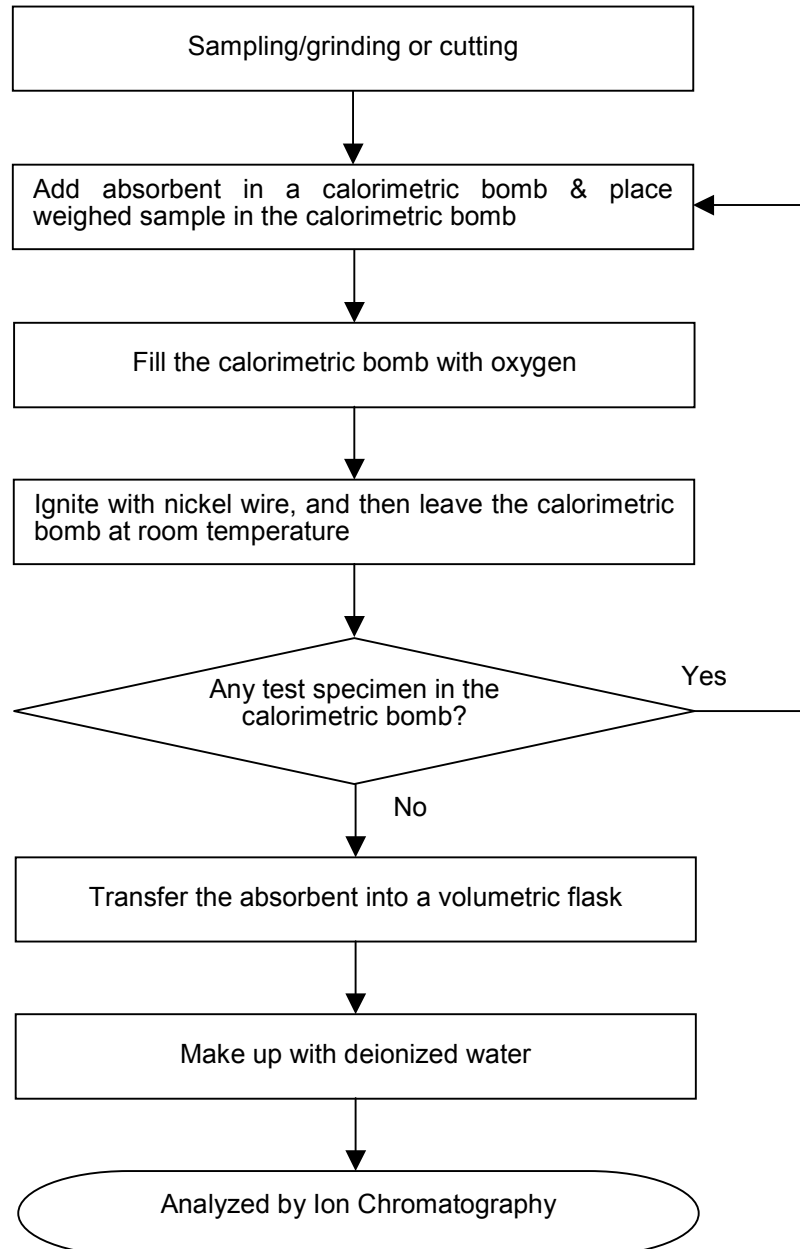
**Test Report**

Number: SZHH0058701805

Tests Conducted

(III) Measurement Flowchart:

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



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