

## 測試報告 Test Report

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日期(Date) : 2013/10/09

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高柏科技有限公司

T-GLOBAL TECHNOLOGY CO., LTD.

桃園縣桃園市大仁路50巷33號

NO. 33, LN. 50, DAREN RD., TAOYUAN CITY, TAOYUAN COUNTY 33068, TAIWAN (R. O. C.)



以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as) :

樣品名稱(Sample Description) : 2012/9/13 HEAT SPREADER (散熱銅片)  
樣品型號(Style/Item No.) : PH3  
收件日期(Sample Receiving Date) : 2013/10/02  
測試期間(Testing Period) : 2013/10/02 TO 2013/10/09

=====  
測試需求(Test Requested) : (1) 依據客戶要求, 參考RoHS 2011/65/EU Annex II 指令進行鎘, 鉛, 汞, 六價鉻, 多溴聯苯, 多溴聯苯醚測試. (As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.)  
(2) 依據客戶指定, 進行全氟辛酸、全氟辛烷磺酸、鹵素-氟、氯、溴、碘測試. (As specified by client, to test PFOA, PFOS, Halogen-Fluorine, Chlorine, Bromine, Iodine contents in the submitted sample.)

測試方法(Test Method) : 請見下一頁 (Please refer to next pages).

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

結論(Conclusion) : (1) 根據客戶所提供的樣品, 其鎘, 鉛, 汞, 六價鉻, 多溴聯苯, 多溴聯苯醚的測試結果符合RoHS指令2002/95/EC的更新指令2011/65/EU之要求 (Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.)



Edison Chang / Sr. Supervisor  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei

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## 測試結果(Test Results)

測試部位(PART NAME) No.1 : 黑色/銅色片狀 (BLACK/COPPER COLORED SHEET)

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)	法規 限值 (Limit)
				No.1	
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013方法, 以感應 耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	100
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013方法, 以感應 耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4: 2013方法, 以感應 耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.	1000
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321: 2008 - Annex C方 法, 以UV-VIS檢測. / With reference to IEC 62321: 2008 - Annex C and performed by UV-VIS.	2	n.d.	1000
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C: 2007方法, 以液 相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	參考US EPA 3550C: 2007方法, 以液 相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. 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 極限值 (MDL)	結果 (Result)	法規 限值 (Limit)		
				No.1			
<b>多溴聯苯總和 / Sum of PBBs</b>	mg/kg	參考IEC 62321: 2008 - Annex A方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008 - Annex A and performed by GC/MS.	-	n.d.	1000		
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.	-		
<b>多溴聯苯醚總和 / Sum of PBDEs</b>					-	n.d.	1000
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.	-		

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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)	法規 限值 (Limit)
				No.1	
<b>鹵素 / Halogen</b>					
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.	-
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.	-
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.	-
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	-

**備註(Note) :**

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)

**PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 757/2010**

PFOS濃度在物質或製備中不得超過0.001%(10ppm), 在半成品、成品或零部件中不得超過0.1%(1000ppm), 在紡織品或塗層材料中不得超過1µg/m<sup>2</sup>。(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m<sup>2</sup>.)

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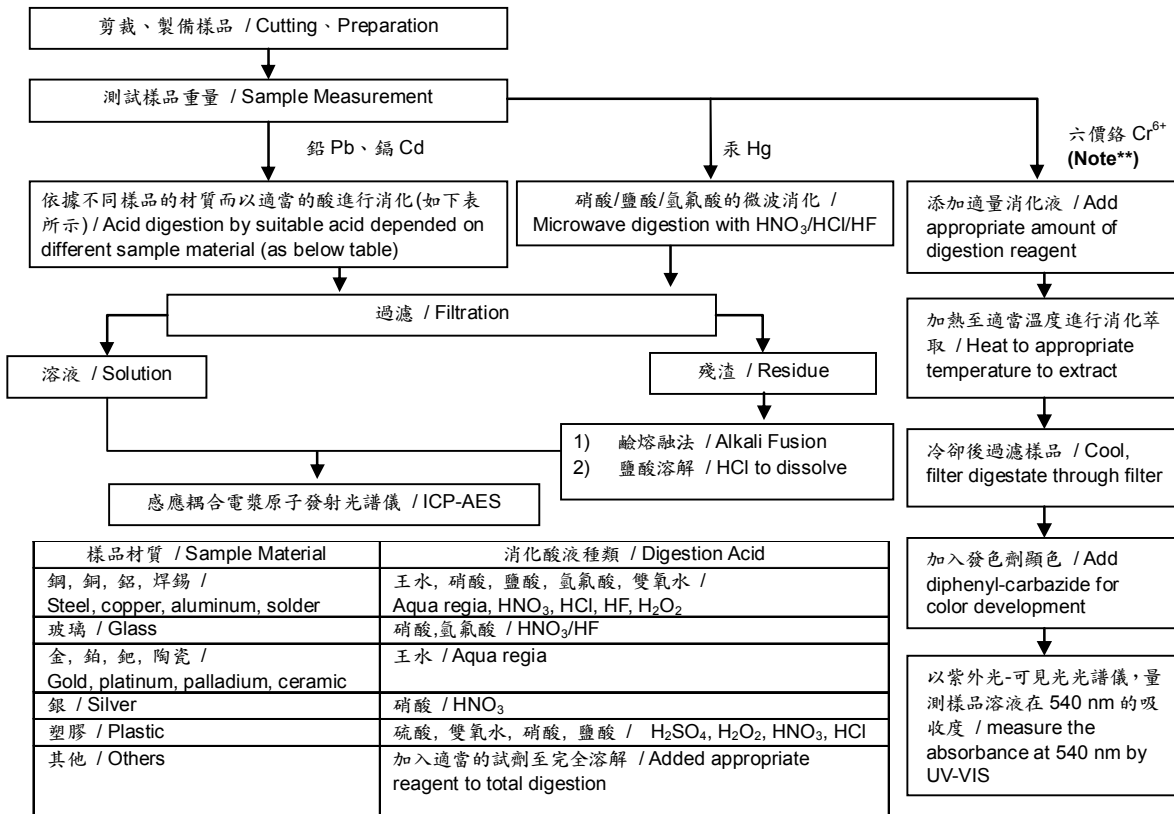
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- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
-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



**Note\*\*:** (1) 針對非金屬材料加入鹼性消化液，加熱至 90~95°C 萃取。 / For non-metallic material, add alkaline digestion reagent and heat to 90~95°C.  
 (2) 針對金屬材料加入純水，加熱至沸騰萃取。 / For metallic material, add pure water and heat to boiling.

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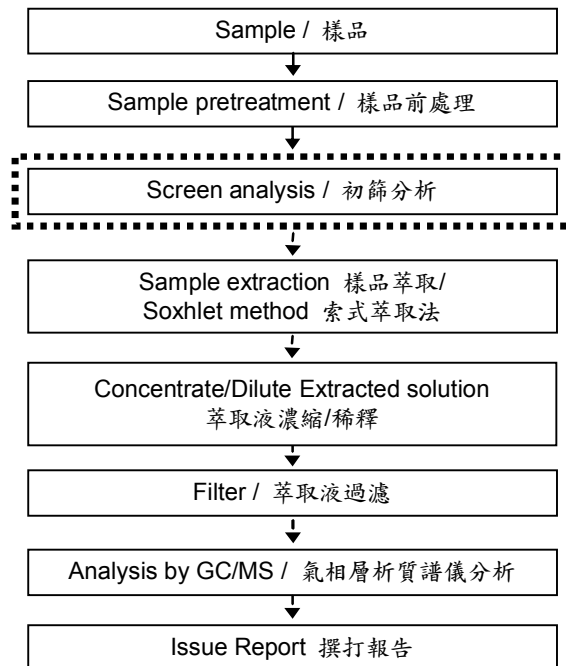
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### 多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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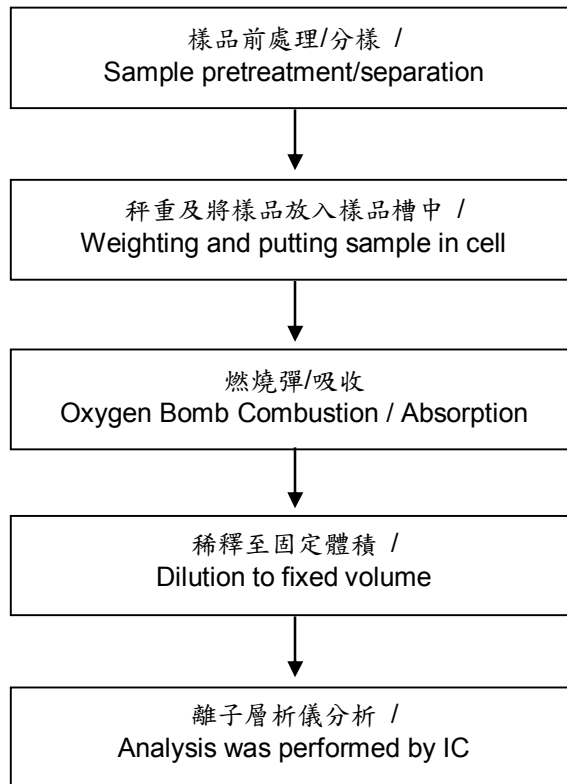
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### 鹵素分析流程圖 / Analytical flow chart of halogen content

- 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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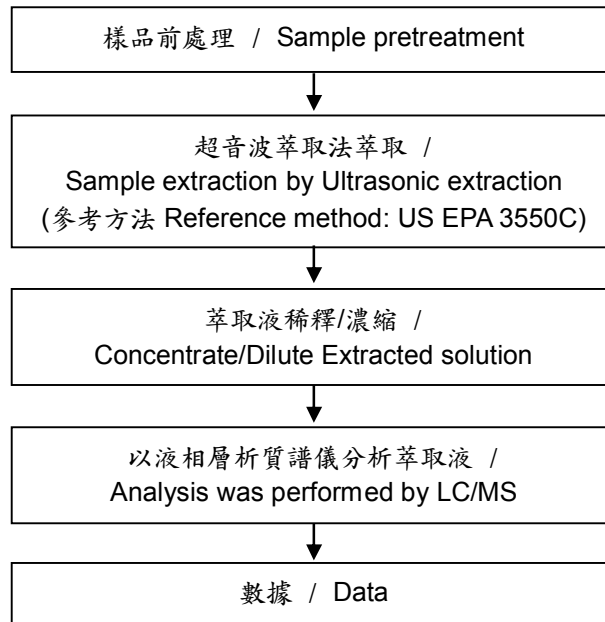
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### 全氟辛酸/全氟辛烷磺酸分析流程圖 / PFOA/PFOS analytical flow chart

- 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





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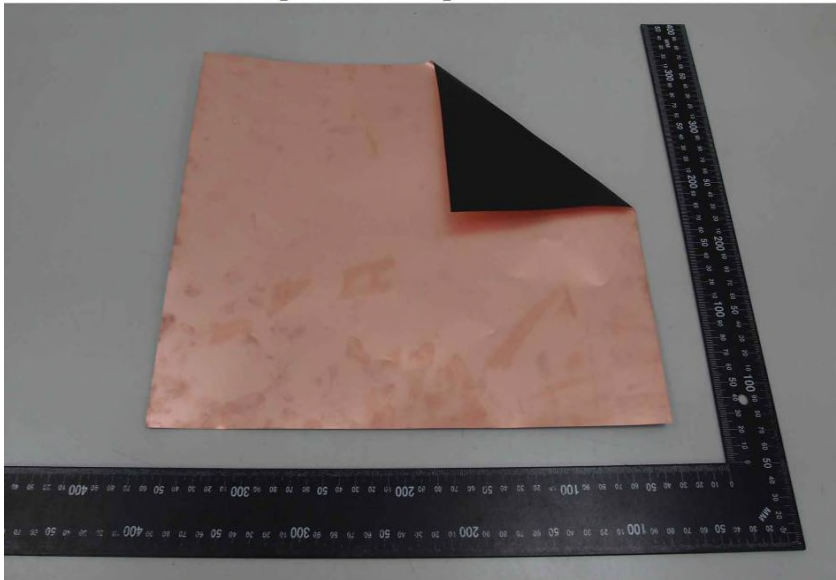
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**\* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。\***  
(The tested sample / part is marked by an arrow if it's shown on the photo.)

### CE/2013/A0238



**\*\* 報告結尾(End of Report) \*\***