

測試報告 Test Report

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旺宏電子股份有限公司

MACRONIX INTERNATIONAL CO., LTD.

新竹科學工業園區研新四路8號KE330

NO. 8, CREATION ROAD IV, SCIENCE PARK, HSIN-CHU, TAIWAN, R. O. C.



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) : KH-8SOP / 32PLCC
樣品型號(Style/Item No.) : (1)SUBCON:CHIPMOS,GREATEK,OSE,SITEC;(2)L/F
MATERIAL:COPPER,ALLOY42;(3)EPOXY:SUMITOMO 1076DJ,ABLEBOND
8340,HITACHI 4900,YIZ-9112LV;(4)GOLD WIRE;(5)COMPOUND:SHINETSU KMC-
3510,SUMITOMO G600,HITACHI 9200HF,ELER-8-
560;(6)PLATING:SN;(7)DIE:SILICON。
收件日期(Sample Receiving Date) : 2008/4/7
測試期間(Testing Period) : 2008/4/7 TO 2008/4/14

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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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測試結果(Test Results)

測試部位(PART NAME) NO.1 : 混測黑色本體 (MIXED ALL PARTS OF BLACK BODY)
 測試部位(PART NAME) NO.2 : 混測銀色金屬(含鍍層) (MIXED SILVER COLORED METAL (INCLUDING THE PLATING LAYER))

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	NO.2
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321/2nd CDV (111/95/CDV) 方法, 用感應耦合電漿原子發射光譜儀 (ICP-AES) 檢測鎘含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Cadmium by ICP-AES.	2	n.d.	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321/2nd CDV (111/95/CDV) 方法, 用感應耦合電漿原子發射光譜儀 (ICP-AES) 檢測鉛含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Lead by ICP-AES.	2	n.d.	17
汞 / Mercury (Hg)	mg/kg	參考IEC 62321/2nd CDV (111/95/CDV) 方法, 用感應耦合電漿原子發射光譜儀 (ICP-AES) 檢測汞含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Mercury by ICP-AES.	2	n.d.	n.d.
六價鉻 / Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	針對非金屬材質之樣品, 參考IEC 62321/2nd CDV (111/95/CDV) 方法檢測, 用UV-VIS檢測六價鉻含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Hexavalent Chromium for non-metallic samples by UV-Vis Spectrometry.	2	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)	
				NO.1	NO.2
六價鉻 / Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	**	針對金屬材質之樣品, 參考IEC 62321/2nd CDV (111/95/CDV)方法檢測, 用Spot test / Colorimetric方法檢測六價鉻含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Hexavalent Chromium for metallic samples by Spot test / Colorimetric Method. (See Note 8)	0.02mg/kg with 50 cm ² surface area	---	Negative
多溴聯苯總和 / Sum of PBBs			-	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 (一至九溴) / Sum of PBDEs (Mono to Nona) (Note 4)	mg/kg	參考IEC 62321/2nd CDV (111/95/CDV)方法, 以氣相層析儀/質譜儀檢測多溴聯苯和多溴聯苯醚含量. / With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of PBB and PBDE by GC/MS.	-	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.	---
多溴聯苯醚總和 (一至十溴) / Sum of PBDEs (Mono to Deca)			-	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)	
				NO.1	NO.2
鹵素 / Halogen	---	參考BS EN 14582:2007, 以離子層析儀分析氟, 氯, 溴, 碘含量. / With reference to BS EN 14582:2007. Analysis was performed by IC method for F, Cl, Br, I content.	---	---	---
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 007782-41-4)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析氟含量. / With reference to BS EN 14582:2007. Analysis was performed by IC method for Fluorine content.	50	n.d.	---
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 007782-50-5)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析氯含量. / With reference to BS EN 14582:2007. Analysis was performed by IC method for Chlorine content.	50	74	---
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 007726-95-6)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析溴含量. / With reference to BS EN 14582:2007. Analysis was performed by IC method for Bromine content.	50	154	---
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 007553-56-2)	mg/kg	參考BS EN 14582:2007, 以離子層析儀分析碘含量. / With reference to BS EN 14582:2007. Analysis was performed by IC method for Iodine content.	50	n.d.	---

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備註(Note) :

1. mg/kg = ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. 根據2005年10月13日歐盟會議公佈2005/717/EC, 修訂2002/95/EC內容, 通過解除高分子材質中十溴聯苯醚之使用限制. (According to 2005/717/EC DecaBDE is exempt.)
5. "-" = Not Regulated (無規格值)
6. "---" = Not Conducted (未測項目)
7. ** = Qualitative analysis (No Unit) 定性分析(無單位)
8. Spot-test:
 - Negative = Absence of Cr(VI) coating / surface layer(鍍層中偵測不到六價鉻),
 - Positive = Presence of Cr(VI) coating / surface layer(鍍層中偵測到六價鉻);
 - The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.
 - (當該測項無法確認時, 測試樣品可藉由boiling-water-extraction測試方法進一步確認)
- Boiling-water-extraction:
 - Negative = Absence of Cr(VI) coating / surface layer(鍍層中偵測不到六價鉻),
 - Positive = Presence of Cr(VI) coating / surface layer(鍍層中偵測到六價鉻);
 - the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.
 - 該溶液濃度 ≥ 0.02 mg/kg with 50 cm² (sample surface area)
9. 樣品的測試是基於申請人要求混合測試, 報告中的混合測試結果不代表其中個別單一材質的含量. (The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

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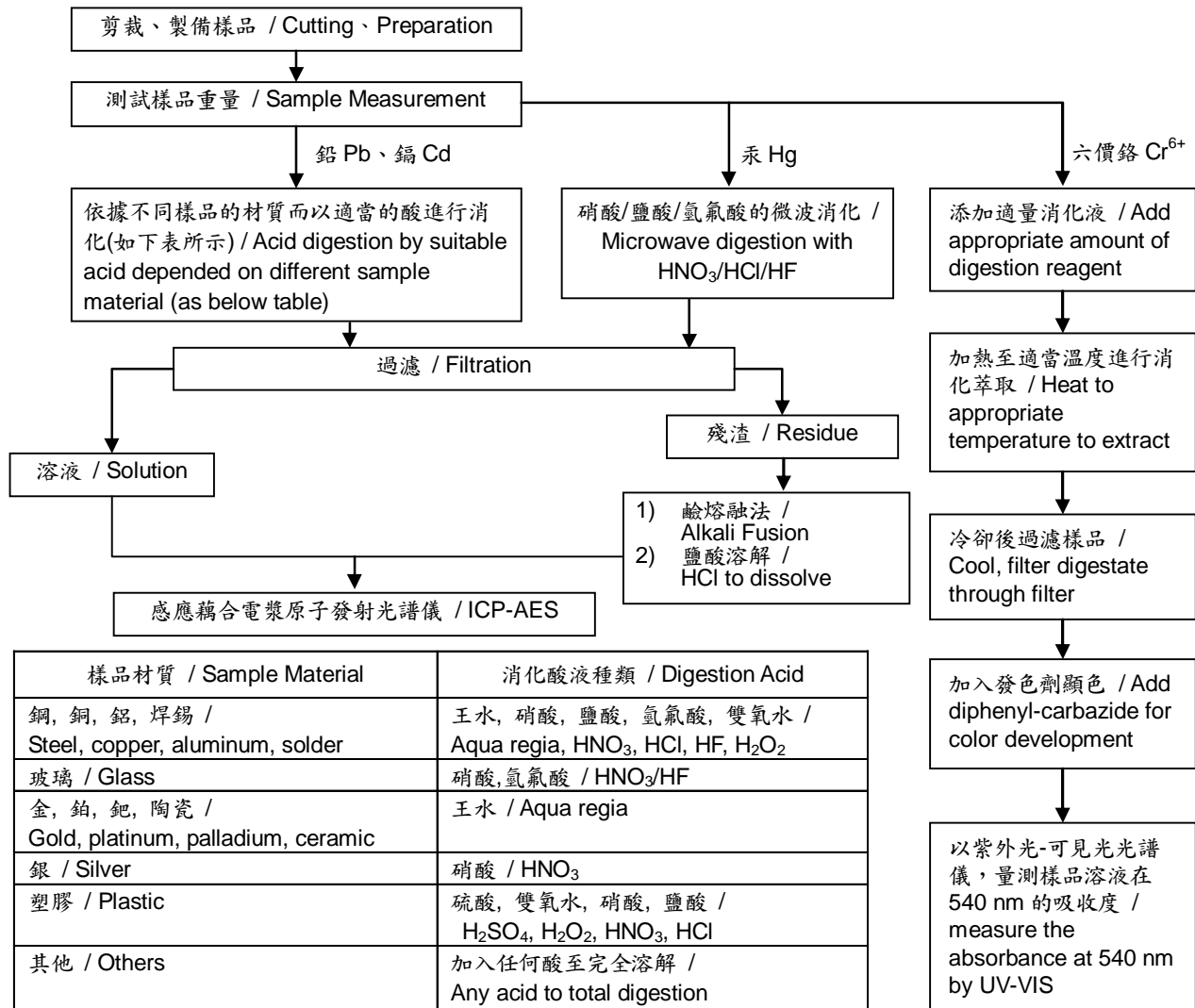
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- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) 測試人員：張啓興 / Name of the person who made measurement: Troy Chang
- 3) 測試負責人：龔振裕 / Name of the person in charge of measurement: Chenyu Kung



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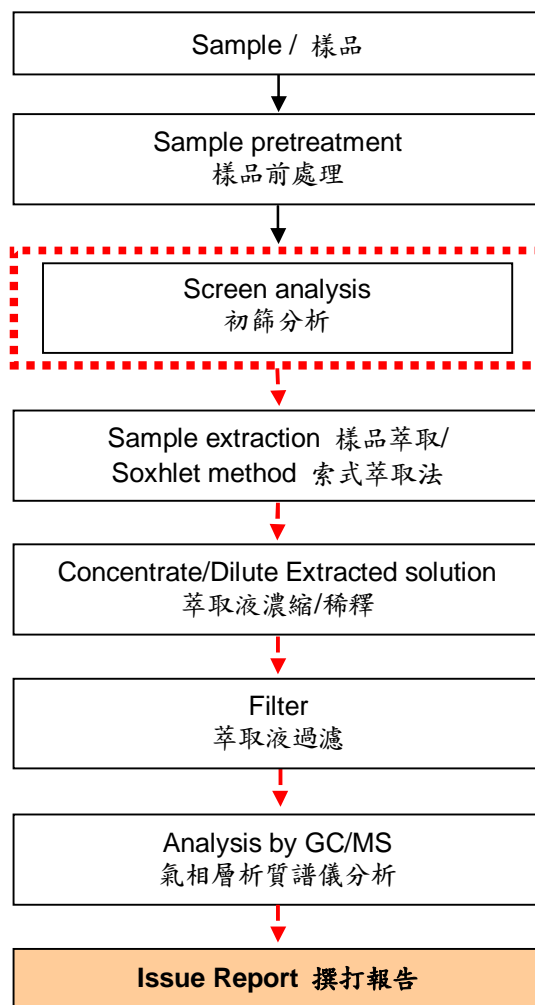
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多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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

