

Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 1 of 14

聯茂電子股份有限公司

ITEQ CORPORATION

桃園縣平鎮市工業區工業一路22號

22, KUNG YEH 1ST RD., PING CHEN INDUSTRIAL ZONE, PING CHEN, TAOYUAN, TAIWAN, R. O. C.

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) : PREPREG

樣品型號(Style/Item No.) : IT-180BS NO-FLOW

收件日期(Sample Receiving Date) : 2012/09/19

測試期間(Testing Period) : 2012/09/19 TO 2012/09/26

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





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 2 of 14

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測試結果(Test Results)

測試部位(PART NAME)No.1 : 黄色片狀 (YELLOW SHEET) (重量weight: 142.4g)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値	結果 (Result)
		·	(MDL)	No.1
鎬 / Cadmium (Cd)	mg/kg	 參考IEC 62321: 2008方法,以感應耦合電漿原	2	n.d.
鉛 / Lead (Pb)	mg/kg	多考IEC 62321: 2008为法,以思應稱合電泵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		2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	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.
绨 / Antimony (Sb)	mg/kg	參考US EPA 3052方法,以感應耦合電漿原子發射光譜儀檢測銻含量. / With reference to US EPA Method 3052 for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.
三氧化二銻 / Antimony trioxide (Sb ₂ O ₃)*** (CAS No.: 1309-64-4)	mg/kg	參考US EPA 3052方法,以感應耦合電漿原子發射光譜儀檢測. / With reference to US EPA Method 3052. Analysis was performed by ICP-AES.***	-	n.d.
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3050B方法,以感應耦合電漿原子 發射光譜儀檢測鈹含量. / With reference to US EPA Method 3050B for Beryllium Content. Analysis was performed by ICP- AES.	2	n.d.
氧化鈹 / Beryllium oxide (BeO)***	mg/kg	參考US EPA 3050B方法,以感應耦合電漿原子 發射光譜儀檢測. / With reference to US EPA Method 3050B. Analysis was performed by ICP-AES.***	-	n.d.



Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 3 of 14

聯茂電子股份有限公司

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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
鎳 / Nickel (Ni)	mg/kg	參考US EPA 3050B方法,以感應耦合電漿原子 發射光譜儀檢測鎳含量. / With reference to US EPA Method 3050B for Nickel Content. Analysis was performed by ICP-AES.	2	n.d.
聚氣乙烯 / PVC	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	-	Negative
四溴雙酚-A / Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	mg/kg	参考DIN 53313方法,以氣相層析/質譜儀檢測. / With reference to DIN 53313 method. Analysis was performed by GC/MS.	10	n.d.
六溴環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 25637-99-4)	mg/kg	参考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.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	参考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(銨)/ 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.
鹵素 / Halogen				
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	1240
鹵素 (氣) / Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	参考BS EN 14582:2007, 以離子層析儀分析. /	50	523
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	79100
鹵素(碘)/ Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.

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Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 4 of 14

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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	結果 (Result)
多溴聯苯總和 / Sum of PBBs	mg/kg		(MDL)	No.1
一溴聯苯 / Monobromobiphenyl			5	n.d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5 	
• •	mg/kg			n.d.
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n.d.
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n.d.
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n.d.
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n.d.
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n.d.
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n.d.
十溴聯苯 / Decabromobiphenyl	mg/kg	參考IEC 62321: 2008方法,以氣相層析/質譜 儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	5	n.d.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg		5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n.d.
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n.d.



Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 5 of 14

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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. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
- 7. ***: 該物質是由銻、鈹之測試結果計算得知. 其MDL是針對銻、鈹之評估. (The substance was calculated by the test results of Antimony, Beryllium. The MDL was evaluated for Antimony, Beryllium respectively.)

 $AX = A \times F$

AX	A	F
三氧化二銻 / Antimony trioxide (Sb ₂ O ₃)	绨 / Antimony	1.1971
氧化鈹 / Beryllium oxide (BeO)	鈹 / Beryllium	2.7753

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1ug/m2。

(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 $1\mu g/m^2$.)



Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 6 of 14

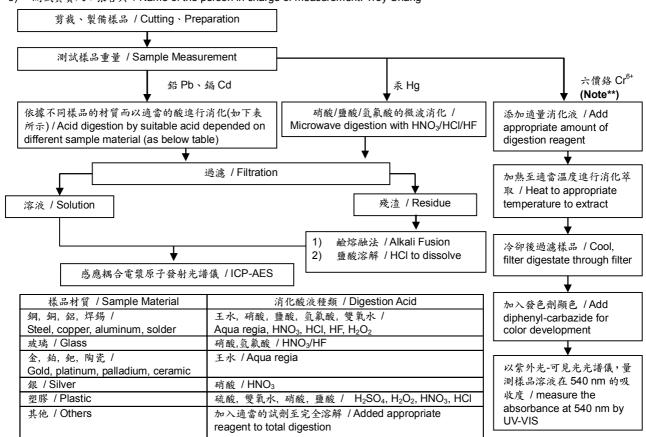
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22, KUNG YEH 1ST RD., PING CHEN INDUSTRIAL ZONE, PING CHEN, TAOYUAN, TAIWAN, R. O. C.

- 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) 测試人員:楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 测試負責人: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℃萃取. / For non-metallic material, add alkaline digestion reagent and heat to 90~95℃.

(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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Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 7 of 14

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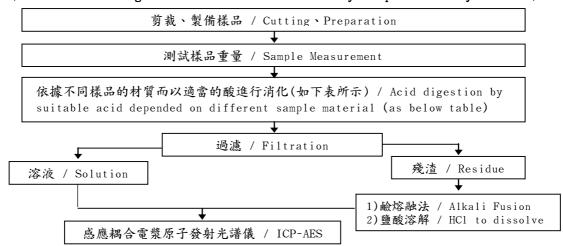
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- 1) 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) 測試人員:楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人:張啓興 / Name of the person in charge of measurement: Troy Chang

元素以 ICP-AES 分析的消化流程圖

(Flow Chart of digestion for the elements analysis performed by ICP-AES)



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 /
	Aqua regia, HNO3, HC1, HF, H2O2
玻璃 / Glass	硝酸,氫氟酸 / HNO ₃ /HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO₃
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H2SO4, H2O2, HNO3, HC1
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate
	reagent to total digestion



Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 8 of 14

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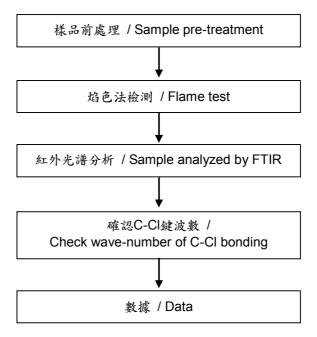
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聚氯乙烯物質判定分析流程圖 /

Analysis flow chart for determination of PVC in material

- 測試人員:陳君涵 / Name of the person who made measurement: Ginny Chen
- 測試負責人:張啓興 / Name of the person in charge of measurement: Troy Chang





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 9 of 14

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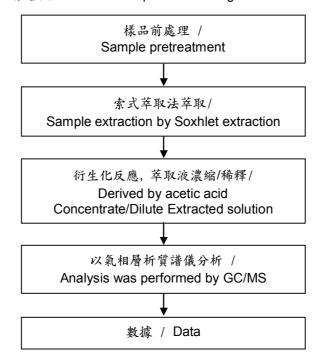
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四溴雙酚 A 分析流程圖 / TBBP-A analytical flow chart

- 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





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 10 of 14

聯茂電子股份有限公司

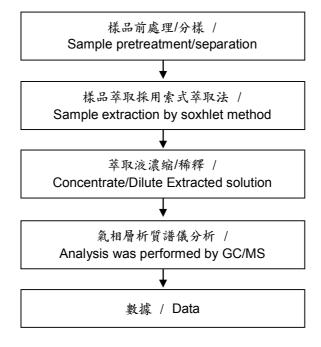
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六溴環十二烷分析流程圖 / HBCDD analytical flow chart

- 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





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 11 of 14

聯茂電子股份有限公司

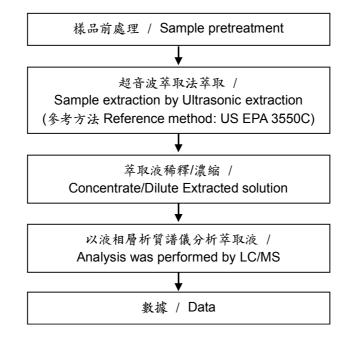
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全氟辛酸(銨)/全氟辛烷磺酸分析流程圖 / PFOA/PFOS analytical flow chart

- 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





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 12 of 14

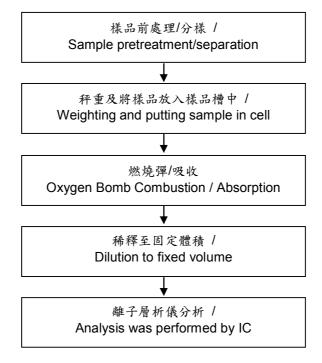
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鹵素分析流程圖 / Analytical flow chart of halogen content

- 1) 測試人員: 陳恩臻 / 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





Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 13 of 14

聯茂電子股份有限公司

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22, KUNG YEH 1ST RD., PING CHEN INDUSTRIAL ZONE, PING CHEN, TAOYUAN, TAIWAN, R. O. C.

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 - - - - →

Sample / 樣品 Sample pretreatment / 樣品前處理 Screen analysis / 初篩分析 Sample extraction 樣品萃取/ Soxhlet method 索式萃取法 Concentrate/Dilute Extracted solution 萃取液濃縮/稀釋 Filter / 萃取液過濾 Analysis by GC/MS / 氣相層析質譜儀分析 Issue Report 撰打報告



Test Report

號碼(No.) : CE/2012/93671 日期(Date) : 2012/09/26 頁數(Page) : 14 of 14

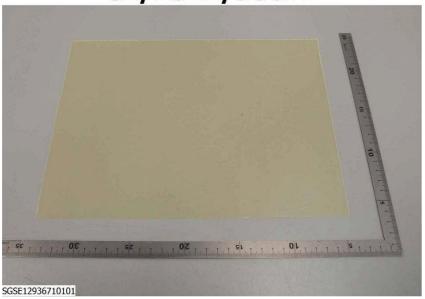
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2012/93671



** 報告結尾 (End of Report) **