

測試報告 Test Report

號碼(No.): CE/2018/A5868

日期(Date): 2018/11/06

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希華晶體科技股份有限公司
SIWARD CRYSTAL TECHNOLOGY CO., LTD.
台中市潭子區中山路三段111巷1之1號
NO. 1-1, LN. 111, SEC. 3, ZHONGSHAN RD., TANZI DIST., TAICHUNG CITY 427, 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): 送樣廠商(Sample Submitted By) 希華晶體科技股份有限公司(SIWARD CRYSTAL TECHNOLOGY CO., LTD.) : 樣品名稱(Sample Description) • SEAM TYPE XTAL (C)SF SERIES, (C)SX SERIES, (C)SXT SERIES 樣品型號(Style/Item No.) : 收件日期(Sample Receiving Date) 2018/10/31 • 測試期間(Testing Period) 2018/10/31 TO 2018/11/06 _____

測試需求(Test Requested):

- (1) 依據客戶指定,參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯 苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)
- (2) 其他測試項目請見下一頁. (Please refer to next pages for the other item(s).)

测試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).





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<u>測試結果(Test Results)</u>

測試部位(PART NAME)No.1 : SEAM TYPE XTAL ((C)SX SERIES)

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 62321-5 (2013),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.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5 (2013),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.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013),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.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	参考IEC 62321-7-2 (2017),以UV-VIS檢 測. / With reference to IEC 62321-7- 2 (2017) and performed by UV-VIS.	8	n. d.
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015),以氣相層析儀 /質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
ー溴聯苯 / Monobromobiphenyl	mg/kg		5	n. d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5	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		5	n. d.



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Test Report 希華晶體科技股份有限公司

市華 面盤杆投版份有限公司 SIWARD CRYSTAL TECHNOLOGY CO., LTD. 台中市潭子區中山路三段111巷1之1號 NO 1-1 IN 111 SEC 3 THONGSHAN RD

NO. 1-1, LN. 111, SEC. 3, ZHONGSHAN RD., TANZI DIST., TAICHUNG CITY 427, TAIWAN (R. O. C.)

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
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	参考IEC 62321-6 (2015),以氣相層析儀 /質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n. d.
ー溴聯苯醚 / 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.
鄰苯二甲酸丁苯甲酯 / BBP(Butyl Benzyl phthalate)(CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017),以魚相層析儀 /質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n. d.
鄰苯二甲酸二丁酯 / DBP(Dibuty1 phthalate)(CAS No.: 84-74-2)	mg/kg		50	n. d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n. d.
鄰苯二甲酸二異丁酯 / DIBP(Di-isobutyl phthalate)(CAS No.: 84-69-5)	mg/kg		50	n. d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0; 68515-49-1)	mg/kg		50	n. d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0; 68515-48-0)	mg/kg		50	n. d.
鄰苯二甲酸二正辛酯 / DNOP(Di-n- octyl phthalate)(CAS No.: 117-84-0)	mg/kg		50	n. d.



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結果 方法偵测 單位 测試方法 测試項目 (Result) 極限值 (Test Items) (Unit) (Method) (MDL) No. 1 六溴環十二烷及所有主要被辨別出的異構物 參考IEC 62321 (2008),以氣相層析儀/ 5 mg/kg n. d. / Hexabromocyclododecane (HBCDD) and 質譜儀檢測. / With reference to IEC all major diastereoisomers identified 62321 (2008). Analysis was performed $(\alpha - \text{HBCDD}, \beta - \text{HBCDD}, \gamma - \text{HBCDD})$ (CAS by GC/MS. No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) 鹵素 / Halogen 鹵素 (氟) / Halogen-Fluorine (F) mg/kg 50n. d. (CAS No.: 14762-94-8) 鹵素 (氯) / Halogen-Chlorine (C1) n. d. 50 mg/kg 參考BS EN 14582 (2016),以離子層析儀 (CAS No.: 22537-15-1) 分析. / With reference to BS EN 鹵素(溴) / Halogen-Bromine (Br) 14582 (2016). Analysis was performed mg/kg 50 n.d. (CAS No.: 10097-32-2) by IC. 鹵素 (碘) / Halogen-Iodine (I) (CAS 50 n.d. mg/kg No.: 14362-44-8) 全氟辛烷磺酸 / Perfluorooctane 參考US EPA 3550C (2007),以液相層析 mg/kg 10 n. d. sulfonates (PFOS-Acid, Metal Salt, 儀/質譜儀檢測. / With reference to Amide) US EPA 3550C (2007). Analysis was performed by LC/MS. 參考US EPA 3550C (2007),以液相層析 全氟辛酸 / PFOA (CAS No.: 335-67-1) 10 mg/kg n. d. 儀/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS. 參考US EPA 3050B (1996),以感應耦合 銻 / Antimony (Sb) 2 n.d. mg/kg 電漿原子發射光譜儀檢測. / With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES. 鈹 / Beryllium (Be) mg/kg 參考US EPA 3050B (1996),以感應耦合 2 n.d. 電漿原子發射光譜儀檢測. / With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES.

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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)

PFOS参考資訊(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/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 $1\mu g/m^2$.)



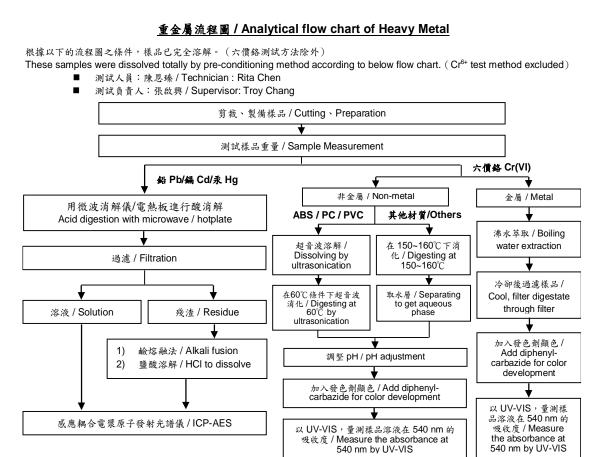
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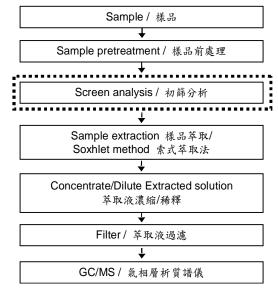
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: 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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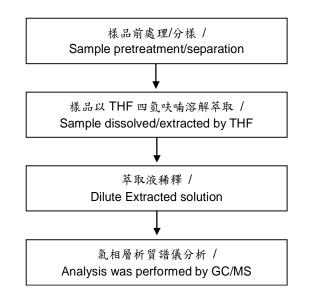
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<u>可塑劑分析流程圖 / Analytical flow chart - Phthalate</u>

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang

【测試方法/Test method: IEC 62321-8】





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

 測試負責:涂雅苓 / Technician: Yaling Tu
測試負責人:張啟興 / Supervisor: Troy Chang
樣品前處理 / Sample pretreatment
樣品萃取 Sample extraction / 超音波萃取法 Ultrasonic method
基本取液濃縮/稀釋 / Concentrate/Dilute Extracted solution
革取液過濾 / Filter
以氣相層析/質譜儀分析 / Analysis was performed by GC/MS
數據 / Data



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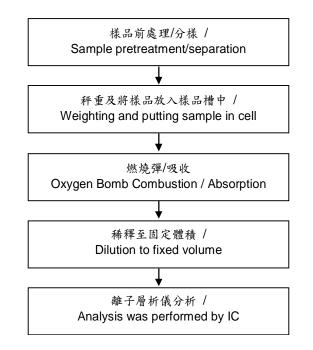
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<u> 鹵素分析流程圖 / Analytical flow chart - Halogen</u>

- 測試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang





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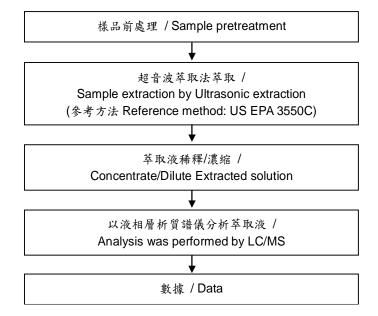
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全氯辛酸/全氯辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang





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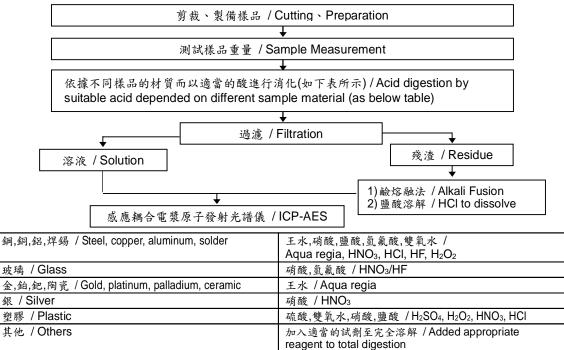
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根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 測試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang







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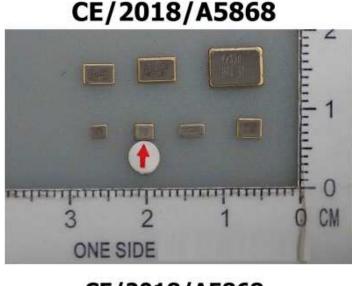
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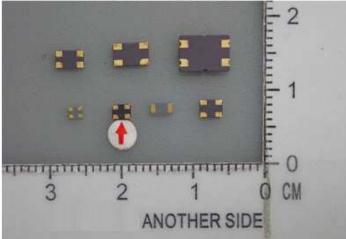
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> * 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)



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** 報告結尾 (End of Report) **