

### **Test Report**

號碼(No.): ETR20A01147 日期(Date): 15-Oct-2020 頁數(Page): 1 of 18

復盛精密工業股份有限公司 (FUSHENG ELECTRONICS CORPORATION) 新竹縣寶山鄉新竹科學工業園區工業東九路17號 (NO. 17, INDUSTRY E. 9TH RD., SCIENCE PARK HSIN-CHU, 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 Name) : LEAD FRAME-MATERIAL (導線架-材料)

樣品型號(Style/Item No.) : Ag (純鍍層)

\_\_\_\_\_\_

收件日(Sample Receiving Date)

: 08-Oct-2020

測試期間(Testing Period)

: 08-Oct-2020 to 15-Oct-2020

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).) 請參閱下一頁 (Please refer to following pages.)

測試結果(Test Results)

結 論(Conclusion) :

(1) 根據客戶所提供的樣品·其編、鉛、汞、六價鉻、多溴聯苯 。多溴聯苯醚, DBP, BBP, DFHP, DIBP的測試結果符合RoHS 2011/65/FU Annex II暨其修訂指令(FU) 2015/86

DEHP, DIBP的測試結果符合RoHS 2011/65/EU Annex II暨其修訂指令(EU) 2015/863 之限值要求。 (Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex

II to Directive 2011/65/EU.)

Troy Chang / Manager - Vec Signed for and behalf of SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 3B34B028



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#### 測試部位敘述 (Test Part Description)

No.1 : 銀色金屬片狀 (Ag (純鍍層)) (SILVER COLORED METAL SHEET (Ag (純鍍層)))

#### 測試結果 (Test Results)

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鎘 (Cd) (Cadmium (Cd)) (CAS No.: 7440-	參考IEC 62321-5: 2013,以感應耦合電漿發	mg/kg	2	n.d.	100
43-9)	射光譜儀分析。(With reference to IEC	3 3			
	62321-5: 2013, analysis was performed by				
	ICP-OES.)				
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿發	mg/kg	2	n.d.	1000
	射光譜儀分析。(With reference to IEC				
	62321-5: 2013, analysis was performed by				
	ICP-OES.)				
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-	參考IEC 62321-4: 2013+ AMD1: 2017,以	mg/kg	2	n.d.	1000
97-6)	感應耦合電漿發射光譜儀分析。(With				
	reference to IEC 62321-4: 2013+ AMD1:				
	2017, analysis was performed by ICP-OES.)				
六價鉻 (Hexavalent Chromium) Cr(VI)	參考IEC 62321-7-1: 2015,以UV-VIS分析。	μg/cm²	0.1	n.d.	-
(CAS No.: 18540-29-9) (#2)	(With reference to IEC 62321-7-1: 2015,				
	analysis was performed by UV-VIS.)				
六價鉻 Cr(VI) (Hexavalent Chromium	參考IEC 62321-7-2: 2017,以紫外光-可見光	mg/kg	8	n.d.	-
Cr(VI)) (CAS No.: 18540-29-9)	分光光度計分析。(With reference to IEC				
	62321-7-2: 2017, analysis was performed				
	by UV-VIS.)				
一溴聯苯 (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)	參考IEC 62321-6: 2015 · 以氣相層析儀/質譜	mg/kg	5	n.d.	-
六溴聯苯 (Hexabromobiphenyl)	儀分析。(With reference to IEC 62321-6:	mg/kg	5	n.d.	-
七溴聯苯 (Heptabromobiphenyl)	2015, analysis was performed by GC/MS.)	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.	-
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.	1000

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復盛精密工業股份有限公司 (FUSHENG ELECTRONICS CORPORATION) 新竹縣寶山鄉新竹科學工業園區工業東九路17號 (NO. 17, INDUSTRY E. 9TH RD., SCIENCE PARK HSIN-CHU, TAIWAN, R.O.C.)

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
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)	參考IEC 62321-6: 2015,以氣相層析儀/質譜	mg/kg	5	n.d.	-
六溴聯苯醚 (Hexabromodiphenyl ether)	儀分析。(With reference to IEC 62321-6:	mg/kg	5	n.d.	-
七溴聯苯醚 (Heptabromodiphenyl ether)	2015, analysis was performed by GC/MS.)	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.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	1	n.d.	1000
六溴環十二烷及所有主要被辨別出的異構物(HBCDD) ( $\alpha$ - HBCDD, $\beta$ - HBCDD, $\gamma$ - HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( $\alpha$ - HBCDD, $\beta$ - HBCDD, $\gamma$ - HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008·以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537- 15-1)	參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097- 32-2)	參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)	參考BS EN 14582: 2016 · 以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.	-

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新竹縣寶山鄉新竹科學工業園區工業東九路17號 (NO. 17, INDUSTRY E. 9TH RD., SCIENCE PARK HSIN-CHU, TAIWAN, R.O.C.)

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
全氟辛烷磺酸及其鹽類 (PFOS and its	參考CEN/TS 15968: 2010 · 以液相層析串聯質	mg/kg	0.01	n.d.	-
salts) (CAS No.: 1763-23-1 and its salts)	譜儀分析。(With reference to CEN/TS 15968:				
	2010, analysis was performed by LC/MS/MS.)				
全氟辛酸及其鹽類 (PFOA and its salts)	參考CEN/TS 15968: 2010 · 以液相層析串聯質	mg/kg	0.01	n.d.	-
(CAS No.: 335-67-1 and its salts)	譜儀分析。(With reference to CEN/TS 15968:				
	2010, analysis was performed by LC/MS/MS.)				
多氯聯苯 (PCBs) (Polychlorinated	參考US EPA 3550C: 2007,以氣相層析儀/質	mg/kg	0.5	n.d.	-
biphenyls (PCBs))	譜儀分析。(With reference to US EPA				
	3550C: 2007, analysis was performed by				
	GC/MS.)				
多氯奈 (PCNs) (Polychlorinated	參考US EPA 3550C: 2007,以氣相層析儀/質	mg/kg	5	n.d.	-
naphthalene (PCNs))	譜儀分析。(With reference to US EPA				
	3550C: 2007, analysis was performed by				
	GC/MS.)				
多氯三聯苯 (PCTs) (Polychlorinated	參考US EPA 3550C: 2007,以氣相層析儀/質	mg/kg	0.5	n.d.	-
terphenyls (PCTs))	譜儀分析。(With reference to US EPA				
	3550C: 2007, analysis was performed by				
	GC/MS.)				
短鏈氯化石蠟(C10-C13) (SCCP) (Short	參考US EPA 3550C: 2007,以氣相層析儀/質	mg/kg	100	n.d.	-
Chain Chlorinated Paraffins(C10-C13)	譜儀分析。(With reference to US EPA				
(SCCP)) (CAS No.: 85535-84-8)	3550C: 2007, analysis was performed by				
	GC/MS.)				
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2013,以傅立葉轉換紅外	**	-	Negative	-
	線光譜儀及焰色法分析。(With reference to				
	ASTM E1252: 2013, analysis was				
AV	performed by FT-IR and Flame Test.)				
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	參考US EPA 3050B: 1996,以感應耦合電漿	mg/kg	2	n.d.	-
36-0)	發射光譜儀分析。(With reference to US EPA				
	3050B: 1996, analysis was performed by				
	ICP-OES.)			ļ	
三氧化二銻 (Sb <sub>2</sub> O <sub>3</sub> ) (Antimony trioxide	由銻結果計算得之。(Calculated from the	mg/kg	2▲	n.d.	-
(Sb <sub>2</sub> O <sub>3</sub> )) (CAS No.: 1309-64-4)	result of Antimony.)				



測試項目

### 測試報告 Test Report

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(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-	參考US EPA 3050B: 1996,以感應耦合電漿	mg/kg	2	n.d.	-
41-7)	發射光譜儀分析。(With reference to US EPA				
	3050B: 1996, analysis was performed by				
	ICP-OES.)				
砷 (As) (Arsenic (As)) (CAS No.: 7440-	参考US EPA 3052: 1996·以感應耦合電漿發	mg/kg	2	n.d.	-
38-2)	射光譜儀分析。(With reference to US EPA				
	3052: 1996, analysis was performed by				
	ICP-OES.)				
三丁基錫 (TBT) (Tributyl tin (TBT))	参考ISO 17353: 2004 · 以氣相層析儀/火焰光	)	0.03	n.d.	-
三苯基錫 (TPhT) (Triphenyl tin (TPhT))	度偵測器分析。(With reference to ISO	mg/kg	0.03	n.d.	-
二丁基錫 (DBT) (Dibutyl tin (DBT))	17353: 2004, analysis was performed by	mg/kg	0.03	n.d.	-
二辛基錫 (DOT) (Dioctyl tin (DOT))	GC/FPD.)	mg/kg	0.03	n.d.	-
氧化雙三丁基錫 (TBTO) (Bis(tributyltin)	参考ISO 17353: 2004 · 以氣相層析儀/火焰光	mg/kg	0.03 🛦	n.d.	-
oxide (TBTO)) (CAS No.: 56-35-9)	度偵測器分析;由三丁基錫測試結果計算得				
	之。(With reference to ISO 17353: 2004,				
	analysis was performed by GC/FPD.				
	Calculated from the result of Tributyl Tin				
	(TBT).)				
鄰苯二甲酸二丁酯 (DBP) (Dibutyl		mg/kg	50	n.d.	1000
phthalate (DBP)) (CAS No.: 84-74-2)					
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.	1000
phthalate (BBP)) (CAS No.: 85-68-7)					
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-		mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP)) (CAS	參考IEC 62321-8: 2017 · 以氣相層析儀/質譜				
No.: 117-81-7)	儀分析。(With reference to IEC 62321-8:				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-

測試方法

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phthalate (DIDP)) (CAS No.: 26761-40-

鄰苯二甲酸二異壬酯 (DINP) (Diisononyl

phthalate (DINP)) (CAS No.: 28553-12-

0, 68515-49-1)

0, 68515-48-0)

50

mg/kg

n.d.



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測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl		mg/kg	50	n.d.	=
phthalate (DNOP)) (CAS No.: 117-84-0)	   參考IEC 62321-8: 2017·以氣相層析儀/質譜				
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	養分析。(With reference to IEC 62321-8:	mg/kg	50	n.d.	1000
phthalate (DIBP)) (CAS No.: 84-69-5)	2017, analysis was performed by GC/MS.)				
鄰苯二甲酸二正己酯 (Di-n-hexyl	2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	=
phthalate) (CAS No.: 84-75-3)					

#### 備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. MDL = Method Detection Limit (方法偵測極限值)
- 3. n.d. = Not Detected (未檢出); 小於MDL / Less than MDL
- 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. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including):

CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.

- 8. 全氟辛酸及其鹽類包含 (PFOA and its salts including):
  - CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
- 9. (#2) =
  - a. 當六價鉻結果大於0.13 μg/cm²,表示樣品表層含有六價鉻。(The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).)
  - b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)·表示表層不含六價鉻。(The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating)
  - c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時,無法確定塗層是否含有六價鉻。(The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.)
- 10. ▲: MDL是針對元素/測試化合物之評估。(The MDL was evaluated for element / tested substance.)

換算公式 (Conversion Formula): AX = A × F

AX	А	F
氧化雙三丁基錫 (Bis(tributyltin)oxide) (TBTO)	三丁基錫 (Tributyl Tin)	1.024
三氧化二銻 (Antimony) trioxide (Sb₂O₃)	銻 (Antimony)	1.1971

參數換算表 (Parameter Conversion Table):

https://twap.sgs.com/sgsrsts/chn/download-REACH\_tw.asp

11. 符合性結果之判定係以測試結果與限值做比較。(The statement of compliance conformity is based on comparison of testing results and limits.)

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新北市五股區新北產業園區五權七路 25 號 t+886(02)2299 3939 f+886(02)2299 3237 25, Wu Chyuan 7<sup>th</sup> Road, New Taipei Industrial Park, Wu Ku District, New Taipei City, Taiwan



### **Test Report**

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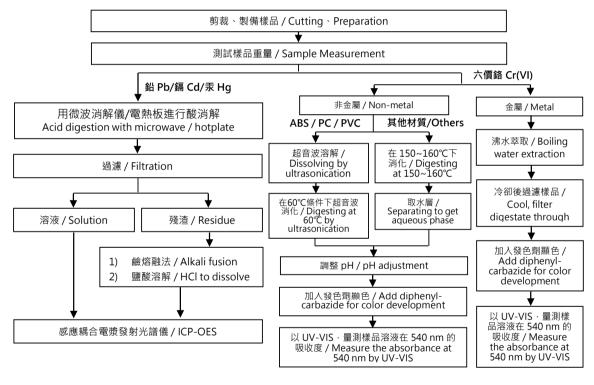
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#### 重金屬流程圖 / Analytical flow chart of Heavy Metal

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. ( $Cr^{6+}$  test method excluded)



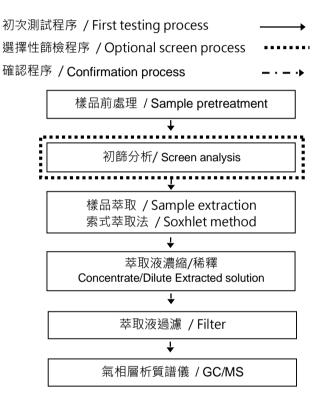


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#### 多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



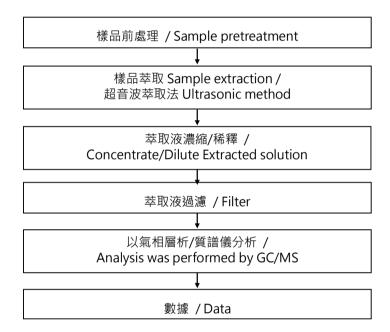


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#### 六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

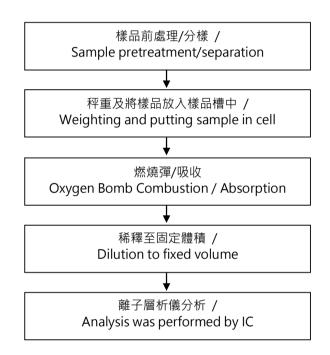




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#### 鹵素分析流程圖 / Analytical flow chart - Halogen

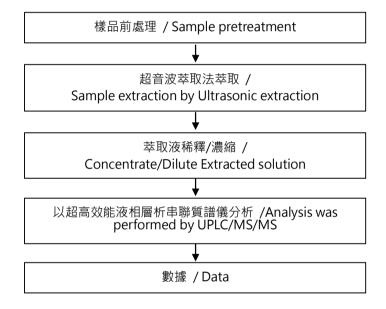




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#### 全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS





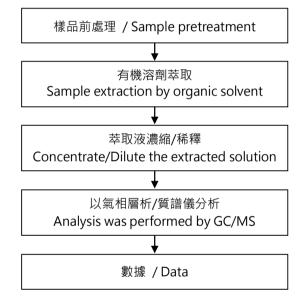
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#### 分析流程圖 / Analytical flow chart

【適用於:多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

\*Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT

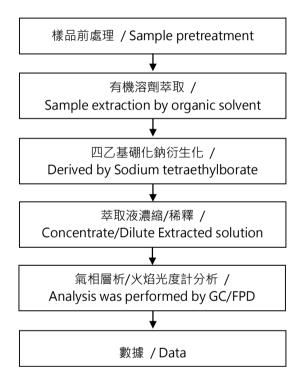




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#### 有機錫分析流程圖 / Analytical flow chart - Organic-Tin

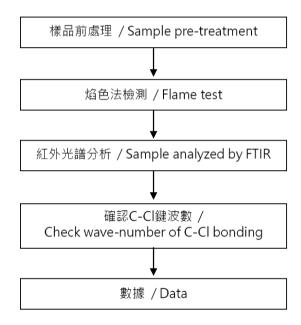




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#### 聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC





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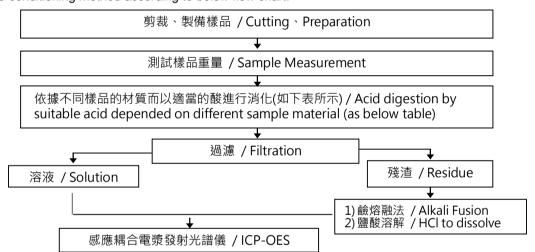
### Test Report

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#### 元素以 ICP-OES 分析的消化流程圖

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

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.



其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
銀 / Silver	硝酸 / HNO₃
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
玻璃 / Glass	硝酸,氫氟酸 / HNO₃/HF
	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 /



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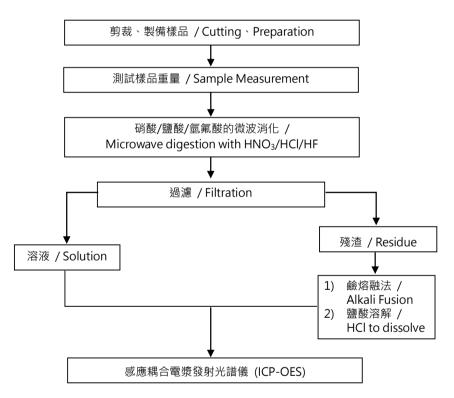
新竹縣寶山鄉新竹科學工業園區工業東九路17號 (NO. 17, INDUSTRY E. 9TH RD., SCIENCE PARK HSIN-CHU, TAIWAN, R.O.C.)

#### 重金屬流程圖 / Analytical flow chart of Heavy Metal

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.

【参考方法/Reference method: US EPA 3051、US EPA 3052】



\* US EPA 3051 方法未添加氫氟酸 / US EPA 3051 method does not add HF.

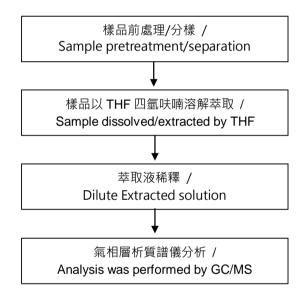


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#### 可塑劑分析流程圖 / Analytical flow chart - Phthalate

#### 【測試方法/Test method: IEC 62321-8】





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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.)

### ETR20A01147



\*\* 報告結尾 (End of Report) \*\*